Cub-H00532-S. CIS585

CALCUTTA UNIVERSITY JOURNAL OF INFORMATION STUDIES

09.07.04

210/5

DEPARTMENT OF LIBRARY & INFORMATION SCIENCE
UNIVERSITY OF CALCUTTA

JCU 323(1)

CUJIS No. 5, 2002-2003

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Published by Dr. D. P. De, Secretary,
Faculty of Education, Journalism & Mass Communication and
Library & Information Science, University of Calcutta,
Asutosh Building, 87/1 College Street, Kolkata-700 073.

Printed by Sri Pradip Kumar Ghosh, Superintendent,
Calcutta University Press, 48, Hazra Road,
Kolkata–700 019

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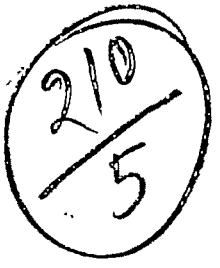

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Introduction

The fifth volume vis-a-vis the fifth annual issue of CUJIS is now published. The CUJIS owes its continuously flourishing existence and well being to the authorities of the University, non-teaching staff members of different departments of the University including our own department, past and present students and the teachers of the Department.

The first article in this volume concerns a very vital issue for Indian librarianship. This is written by one of the most veteran and finest professionals and intellectuals of our field, Sri Arun Kanti Dasgupta. The next essay by one of our young students follows suit and supplements and complements the first. There are three small articles by our young students based on small surveys. The tutorial article in this issue is an overview of ANSI standard Z35.50 for information Retrieval.

During the period from April 2002 to March 2003 a number of events have taken place in the Department.

Ms. Isabelle, Information Officer of the French Embassy in New Delhi visited the Department on 12 December 2002, and gave a discussion lecture on library systems and library science education in France. This was well attended by the students & teachers of the Department and some outside guests. Ms. Isabelle also met the Pro-Vice-Chancellor for Academic Affairs, Professor Suranjan Das. A very preliminary discussion about some collaborative activity involving the Department also took place.

All the campuses of our University and particularly the College Street Campus (Asutosh Shiksha Prangan) have been facing acute problem of space. The Department had been in utter need of a few more rooms. The University authorities could appreciate the need. A lecture room called the Western Gallery in the Hardinge Building has been allotted to the Department.

The results of examinations for 2002 were published in record time (despite double examiner system for theory papers). Results of MLIS Part-II, Part-I and BLIS Examinations were published within 30 days, 40 days and 50 days respectively.

The current session for MLIS Part I (Jan-Dec, 2003) started in January 2003 within one and half months of publication of results of BLIS, Exam. 2002 thus reducing the time gap significantly (by about 9 months).

The Department is working for starting an M Phil (one year) Course in LIS as soon as possible. A memorandum in this regard has been put to the UGC.

The Refresher Course for 2002-03 could not take place as the Academic Staff College of the University was not in a position to release fund.

With active support from the Department the Alumni Association of the Ex-students of the Department held a coaching programme for UGC-NET for the benefit of present and past students of the Department.

The computer labs continue to be developed. Four more celeron P IV machines have been added to the students computer laboratory. Although the number is not sufficient, some resource could be mobilized by doing some thorough budgetary exercise. The Development plans of the Department need to be focussed. The authorities agree that the Department of Library & Information Science is a futuristic Department and it has immense possibilities. At the end of the Golden Jubilee Celebration of the Department in 1995-96 a good sum of money was at hand of the Celebration Committee. Most of this money was utilized for developing a small computer lab of 2.5m x 2.5m dimension furnished with false ceiling, flooring, lighting, necessary electrical connections, an AC machine and a few tables and tools. A computer machine (P1) was also added.

During 2000-2002 a new computer lab for students was eked out by adjusting two adjacent rooms. The lab is fitted with proper flooring, ceiling and electrical wiring. It has provision for 2 AC machines (one AC machine has been installed). The lab is of size 8m x 4m. It has capacity to accommodate about 30 machines including a powerful server. The server was already acquired during financial year 2001-2002. The plan envisages a LAN connected system of at least 20 machines. A separate machine would have Internet connection. The labs need one or two projectors like LCD projector and Epidiascope. The smaller lab is now earmarked for research and use by teachers and research scholars.

For sometime past the Department is trying to develop a Departmental library cum workshop. A space has already been

earmarked. The room needs to be further furnished with shelves. The library in the Department is in the status of a Seminar Library. This should be elevated to the status of a Departmental Library. This is urgent as the students have to deal with practice tools and reference materials and other documents continuously.

An endowment scholarship called "South East Asian Subsistence Fellowship" has been arranged. The value of the Fellowship is Rs. 3000/- only. This is to be given to a student of MLIS Part-II who scored highest in the corresponding BLIS examination of the Department among the students pursuing MLIS Part II. This scholarship is first of its kind in the long history of the Department of 57 years.

Teachers of the Department had also their share of achievements and activities Smt. Swapna Banerjee has been promoted to Senior Grade Lecturer. Sri Subir Kumar Sen continues to be member of the International Organizing Committee of the International Society for Scientometrics and Informatrics (ISSI) conference (this time, 2003 to be held in Beijing, China) for the third time. He was also invited as a UGC Visiting Fellow to the DLIS, Sambalpur University for 2 (two) weeks.

Prof. Arjun Dasgupta was nominated a UGC Expert of the Advisory Committee for the DRS programme of the DLIS of Sambalpur University.

Prof. Bhubaneswar Chakrabarti has been nominated as an external expert member of the Board of Studies in Library & Information Science of the Burdwan University.

Sri Sarmishtha Datta has joined as a University Research Fellow. Our students are working successfully in different projects, programmes and activities in library & information science and service.

BIPLAB CHAKRABARTI
Honorary Executive Editor

Our Archival Heritage—What is the Future of the Past?

ARUN KANTI DASGUPTA*

0 PREAMBLE

India's archival heritage is an endangered species, because as a nation we lack historical consciousness. I use the term "archival heritage" to include any documentary resources in any form, which at a given point of time tell us about the past. They contain written words and are the stable currency of historical work. The past has its uses, because without these documentary resources of yesteryears, our historical understanding of the world would have remained fragmentary. They may be conveniently grouped into two categories: (1) the public records, and (2) such documents as manuscripts, and books, periodical and other materials in print. The preservation and maintenance of public records which find homes in national and state archives get some attention. However, nothing much is talked about the vast array of documents in the second category literally gathering dust in many old government and private libraries across the country awaiting total extinction. Many horror stories about the miserable condition of the Asiatic Society Library hardly created any ripple in the community of academics and librarians. The recently published feature "Digital destruction" in The *Statesman* giving an account of what is taking place in the National Library is symptomatic of greater malaise afflicting our archival heritage. But even the press is more interested in highlighting such issues only if they have some sensational elements. More often than not, many newspapers act somewhat as PROs for institutions which want to publicise their intentions to "digitise" their archival collections. In many cases, however, they remain only "intentions" — eggs hardly hatch!

In this presentation, I shall briefly touch upon four interrelated issues,

* Formerly Librarian and Member of Faculty, Administrative Staff College of India, Hyderabad and Chief of Research, Eenadu Group of Newspapers, Hyderabad.

viz., public records, archival material in libraries, the question of digitisation of archival material, lessons from abroad, and finally make some concluding observations.

1 PUBLIC RECORDS

I begin by defining the term "public records", because the terms "archives" and "public records", by usage have become synonymous*. Public records, as a material are the by-products of administrative or official actions. They have been generated in the government departments for purposes of conducting their affairs or which they have used in conducting them. Since they contain information in the administrative context in which they were created or used, they are preserved in the concerned departments for future reference. It is their *official character* that defines public records. Since they have historical value, many governments have established archives, (e.g., National Archives of India) or public records offices, (e.g, Public Records Office in the UK or National Archives and Records Administration in the USA) for housing, preserving and providing access facilities to scholars. This necessitates framing official policy in respect of (i) the period for which they should remain inaccessible, and (ii) what material could be accessed by the public. In many countries, there are statutory provisions to regullate the system. In India, until 1993 we had the *Archival Policy Resolution of the Government of India (December 1, 1972)* which primarily expressed a pious desire to provide for public access to documents of archival value after 30 years of their creation. In 1993, the Parliament enacted the Public Records Act, 1993 (Act No. 69 of 1993) on the lines of the Public Records Act, 1958 (amended in 1967) of the U K.

As a central Act, it is intended to "regulate the management, administration and preservation of public records of the Central Government, Union territory Administrations, public sector undertakings, statutory bodies and corporations, commissions and committees constituted by the Central Government or a Union territory Administration..." (preamble), Public records include, "(i) any document, manuscript and file; (ii) any microfilm, microfiche and facsimile copy of a document; (iii) any reproduction of image or images embodied in such microfilms (whether enlarged or not); and (iv) any other material produced by a computer or by any other device of any record creating agent" (Section 2(e)).

* One of the reasons of course is that although the current definition of "archives" is "collections of historical documents or records", the term originated from the Greek word *arkheia*, meaning "public records" (*The New Oxford Dictionary of English*, 1998, p. 86).

Three other provisions of the Act deserve attention :

(i) public records bearing security classification would not be transferred to the National Archives of India or the Archives of the Union Territory Administration (Section 10);

(ii) these archives are permitted to accept any record of historical or national importance from any other private sources by way of gift, purchase or otherwise (Section 11 (1)); and

(iii) unclassified public records more than thirty years old are open to *bonafide* research scholars (but subject to unspecified exceptions or restrictions!) (Section 12 (1)).

An Archival Advisory Board consisting of 13 members would look after; the operation of the provisions of the Act. Packed with bureaucrats, mercifully, the Board includes one archivist and two university professors of History in the prostgraduate departments.

I do not know whether there are similar statutory provisions governing the flow of public records to State Archives and accessibility to them. All I know is that in some States there are perfunctory Government Orders (more well-known as GOs) for this purpose. This issue also needs to be looked into.

Although on the face of it, the provisions of the Act look nice, there are two contentious issues that need to be widely debated by the academic community. First, how the thirty-year rule would actually be operated in releasing records into the public domain. As stated earlier, the Section 12 (1) of the Act gives discretionary powers to the concerned authority to refuse access even to thirty-year old records. Second, to what extent the all-pervasive and notorious Official Secrets Acts, 1923 would influence this operation. Through the decades, the Act had provided the Government of the day with a cloak of secrecy to withstand most attempts to access to official information. The ambiguous position of the Act allows it to set it aside when convenient or to use it as a legitimate legal defence. It continues to provide the legal framework for regulating the flow of information. Also, the stories of its blatant misuse are legion. The debate on scrapping the Act at the political level, shows that political parties of all hues love its perpetuation whatever they might say in their election manifestos!

This brings us to a rather larger issue – the freedom of information. In this case also, the debate is conducted essentially at a political level. The demand for unfettered accessibility to information is prompted more by political considerations and is not directly related to the writing of history. The operation of the Freedom of Information Act (1966) in the

USA shows that it has encouraged demands for the release of records on espionage, scandals, and corruption. More often than not, demands for disclosure are prompted by corporate rivalries. Nevertheless, the system of freedom of information does have a positive impact on historical writings. Freeing historical records from the stringent official control would provide more material for wider historical research. More importantly, the researchers can take advantage of the disclosure provisions by demanding declassification of particular records. Unfortunately, the Freedom of Information Act, as passed by the Parliament in December 2002, has enough loopholes to make it ineffective. The most damaging one is that, while the law makes it mandatory for public authorities to provide information (albeit with some exceptions), there is no scope to penalise them if they fail to do so. Yet another flaw is the very structure of the mechanism for making appeals against refusals. There is no independent body to Which appeals can be made. Appeals at all stages would be to successive higher levels of the bureaucracy of the concerned departments. I would, therefore, earnestly hope- that academics in general and historians in particular would play a more active role in demanding more liberal accessibility to public records.

While on the issue of public records, I would like to extend their scope to include official documents or government publications:. 1 need not emphasise their importance, because much has been written by experienced librarians about them and sources of their generation, channels of distribution, and the like. Collections: of government publications may be found in a wide variety of libraries which acquire only those which are relevant to their requirements. However, comprehensive collections are reasonably expected to be available in the National Library, State Central libraries, the Central Secretariat Library, and State Secretariat libraries. How are they maintained? Are they readily accessible? These questions need to be raised. Government publications should also be available in departments and offices, which are responsible for their creation. Some such major organizations are the Central Statistical Organization, State Bureaus of Economics and Statistics, Parliament, State legislatures, Office of the Registrar General & Census Commissioner for India. While some of the major organizations preserve and maintain complete sets of their publications, many do not. Therefore, questions like these need to be raised—whether one can get access to a complete set of census documents since 1871 in the Office of the Registrar General? Are the complete sets of state-level census documents available in the State Directorate of Census Operations? It is for the academic community to ask such questions and seek answers, because it is they who benefit most from these documents.

2 ARCHIVAL HERITAGE IN LIBRARIES

There are many large, medium, and small libraries established by the government and also through private initiatives which hold incredibly rich collections of documents of immense historical value. Some of them contain material on local history. The 45th Bengal Library Conference held at Howrah in December 2000 highlighted the importance of these collections. Many social science research institutions have also, over a period of time, developed rich collections on socio-economic issues. It may be said that the archival value of their contents is directly proportional to the age of such wide spectrum of libraries. Since all these libraries are under the control of diverse types of management, it is for the concerned management to take decisions for their preservation, maintenance and even destruction. It is, however, the understanding and appreciation of the intrinsic value of these collections on the part of the authorities, the librarians, and scholar users that only can determine their fate. Unfortunately, most of these collections remain uncared for. Even simple methods such as regular dusting and use of "grandmothers' recipe" to repel insects are not used to save the collections. While in many government libraries it is a sin even to discard old telephone directories (of course, in certain situations they have historical value), many libraries indiscriminately discard older material because they currently lack relevance. It is something like discarding old parents because they have become irrelevant! The reasons always cited for such action is the lack of space. I think that the simplest solution of the problem is to construct even an ugly-looking warehouse and store the discarded material there! There are statutory provisions for awarding heritage status to magnificent old buildings so that-they may be preserved indefinitely. There should be similar provision to save the archival heritage. The State Central Library in Hyderabad is housed in an imposing building overlooking the Musi river. Ironically, the building may be accorded a heritage status to the exclusion of its contents*. Be that as it may, the librarians and academics must find a solution to these problems.

* Nicholson Baker, in his polemical book, *Double Fold — Libraries and the Assault on Paper*, to be referred to later, has this to say about this contradiction: "The National Historic Preservation Act of 1966, as amended, requires federal agencies to disclose to the public, and to the Advisory Council on Historic Preservation, any plans that would affect districts, sites, buildings, or 'objects' that are on the National Register, of Historic Sites, or that meet the register's criteria for inclusion. One of the criteria is that the building or object has 'yielded or may likely to yield, information important to prehistory or history'. No better description of a library collection could be had, and yet nobody as far as I know has tried to apply this law to the Library of Congress's collection

In Hyderabad, a decade back several librarians, academics and retired bureaucrats mooted the idea of establishing a sort of consortium to acquire and store old materials from various libraries in the city in a central storehouse. However, two problems led to the abandonment of the plan—the legal quibble over the ownerships of the collections, and of course financial constraints. Neither the industrialists nor the State Government who were approached were willing to finance the project. I still believe that this is worth pursuing. A librarian in Andhra Pradesh with an "archival mindset" mooted a novel idea. He approached several MPs to allocate from their development funds some amount of money for preserving and maintaining selected libraries rich in archival material. They, however, thought that he is a nut!

3 DIGITAL PRESERVATION

Digitisation is now a buzzword in the IT and library circles. Going by the media reports, it appears that many libraries are either planning or have already embarked upon programmes of digitising their existing collections for their preservation and better accessibility. Because of the potential to integrate digital library collection into the working environment, there is an increasing willingness to indiscriminately digitise-older collections for deriving rather unknown benefits that such exercise would yield. This involves an enormous financial investment. White the private organizations are free to undertake digitising, there should be a wider debate in respect of digital sing our archival heritage. The foundation of modern work on digital archiving in the USA is the 1995 report of the Task Force on Archiving of Digital Information established in 1994 by the Commission on Preservation and Access and the Research Library Group to study the problems of digital preservation. The report of the Task Force is the first comprehensive look at these issues from legal, economic, and organizational view points. It focussed on the dangers of technological obsolescence of the digitisation giving several frightening examples. For example, the report noted that computer programmes no longer exist to analyse the massive data collected by the New York Land Use and Natural Resources Inventory Project in the 1960s. This report remains the most complete study of the field. Literature also abound on the pitfalls involved in the digitising process. The problem must be properly understood before jumping into the fray.

(although the library's Deferrers building is on the National Register); no other law sets limits on what the library can or can't do to, say, its surviving newspapers, or to its decks of books and periodicals"! pp. 103-104.—The next article by Himadri Bhattacharya concerns this book by Baker—Editor.

Two issues need clear understanding. First, none of today's digital media can be guaranteed to last long. The life span of some are frighteningly short. Two authors—one an archivist associated with the National Archives and Records Administration in the USA and the other a computer scientist had observed in a research paper that one "of the main advantages of electronic information is that it is usually digital which ensures that it can be copied and transported without deterioration. Yet, ironically, the preferred media on which the digital information is stored — disk, tape and even CD-ROM—have far shorter lives than acid-free paper or microfilm. Moreover, these media tend to become unsuitable long before they reach their ultimate age limits. As technology evolves, it quickly reaches a point where older media can no longer be accessed by existing equipment. It is only somewhat facetious to express the irony by saying that digital data lasts forever—or five years whichever comes first (*American Archivist* 1992, 55(2), 297). One cynic, however remarked that the only advantage of digital media is that they do not gather dust!

Second, digitaising the material is not the end: of the exercise. Conventional archiving has two components, the process of conservation which takes care of the individual artifacts, and preservation which retains their contents. The corresponding techniques in digital archiving are "refreshing" which aims at preserving sequences of the bits and "migration" which preserves the content at a semantic level, but not the specific sequences of bits,. Both "refreshing" and "migration" require periodic efforts, and constant upgrading of the computers. All these involve not only effort but also money. This is what Claire Tristram, a digital preservationist has to say: "The naive view of digital preservation is that it's merely a question of moving things periodically onto new storage .... before the old format fades away completely. But moving bits is easy. The problem is that the decoding programs that translate the bits are usually junk within five years, while the languages and operating systems they use are in a state of constant changes. Every piece of software, and every datafile, is at its heart written to instruct a given piece of hardware to perform certain tasks. In other words, it is written in the language of a machine, not of humans. Whenever you create a digital thing .... it is stored in a form that you can't read .... [R] ebuilding old hardware or keeping it around forever to interpret nearly extinct software or formats is economically prohibitive". ("Data Extinction". *Technology Review*, October 2002. p. 39).

A third issue is the near destruction of the original in the scanning operation. In the feature article in the *Statesman* aptly titled "Digital Destruction", mentioned earlier, the author referred to the historian

Prof. Gautam Bhadra expressing legitimate concern about the way the precious documents are handled. This reminds me of the book *Double Fold — Libraries and Assault on Paper* by Nicholson Baker (NY, Random House, 2001, xu, 370 p.). In a blistering and thoroughly idiosyncratic expose of how libraries are "destroying" the historical records in order to "save" or "preserve" them, he accused the librarians of lying "shamelessly about the extent of paper's fragility and they continue to lie about it". He makes a case that the Library of Congress and other great libraries have deceived all into believing that books and newspapers printed after 1870 are turning into dust, because they were printed on paper with high acid content. In order to microfilm books printed after 1870, the Library adopted a policy of "disbinding" them, i.e., splitting them down their spines so they could be splayed open and photographed efficiently. Calling this destructive process as "micro-mutilation", Baker observed that microfilming could have been done without harming the books placing them in cradles and adjusting the camera to the appropriate angle. Since the procedure is time consuming, Baker alleged that the preservationists were in such a hurry to "save" books and newspapers from their misdiagnosed deaths that they killed them by "guillotining", i.e., by slicing them down their spines so that the unbound pages lying flat could be microfilmed rapidly!

Baker ends his polemical book making four recommendations. The last one suggests that the "National Endowment for the Humanities should either abolish the US Newspaper Program and the Brittle Books Program entirely, or require as a condition of funding that (1) *all microfilming and digital scanning be nondestructive and* (2) *all originals be saved afterwards*" [emphasis added] (p. 270). His unflinching faith in the near permanency of paper vis-á-vis microform earned him the sobriquet "paper-fetishist."* Be that as it may, the question of digital preservation of our archival resources should be examined thoroughly, as was done by the Task Force in the USA.

4. SOME LESSONS FROM ABROAD

It is a pity that Indian scholars who work on Indian issues have to depend on archival collections which originated in India but have found safe havens in the West. One significant example is the collection of books and other printed material in the Oriental and India Office Collections (OIOC) of the British Library (formerly, the India Office Library and Records). The rich Oriental and India Office Collections were primarily

* See my Keynote address, *Print and Digital Media — Some Random Thoughts*, delivered at the Fortyseventh All India Library Conference held in Warangal (20-23 December 2001), pp. 9-11.

built up with the material received by the British Government under the provision of a piece of colonial legislation; viz., the Press and Registration of Book Act, 1867. Unfortunately, we could not do what the British Government did despite the fact that in addition to the Press and Registration of Books Act, we have another Act in our statute book — the Delivery of Books and Newspapers (public Libraries) Act, 1954. It might hurt our national pride that the British Government did not accede to the joint request by India and Pakistan for the transfer of the Indian documents in the India Office Library to the India-Pakistan subcontinent. In fact, the documents generated in India during the colonial period are more safe in London than in the subcontinent.

Neither the Government of India made similar efforts, nor are there any collaborative efforts of archivists, librarians and scholars to ensure the preservation of archival resources and to provide enhanced access facilities to them. The Commission on Preservation and Access established in the USA in 1986 and the European Commission on Preservation and Access (ECPA) constituted in 1994 with representatives from archives, libraries and the academic community are precisely involved in this task.

The Centre for South Asian Libararies (CASL), recently founded by the Columbia University, the University of Chicago and the Centre for Research Libraries (CRL)—a consortium of North American Universities and Research institutions, is a fine example of cooperative efforts for the preservation of archival material available not only in libraries in the USA but also the valuable collections in the South Asian region. Although incorporated in 2000, the origin of CSAL can be traced back to many other small projects including the South Asian Microfilm Project (SAMP) initiated in 1962 by scholars in the United States. They included several historians such as N Gerald Barrier, Robert Frykenberg, and Kenneth Jones who conceived the idea of collecting rare material and microfilming old books and other documents available in various libraries instead of lamenting over the lack of resource material. The CSAL has now initiated a major programme in South Asia aimed at assembling, documenting and preserving the 'Source material available for historians in the region. In recent years, it has initiated collaborative ventures with several institutions in the region for this purpose. James H Nye, the Chief Bibliographer for South Asia in the University of Chicago Libraries has played a very important role in the establishment of the CASL.* The

* James Nye, recently interviewed by the *Frontline* in Chennai, answered a wide range of questions relating to CSAL in India, electronic journals, digital preservation of print material, and the like. ("Libraries in the hi-tech age". *Frontline* January 17, 2003. pp. 89-91.

CASL is a member of the Council of the South Asia Library Centres established in 2002. The Roja Muthiah Library (Chennai), the Sundarayya Vignana Kendram, and the Urdu Research Centre (both in Hyderabad) are also members of the Council.

What, however, is intriguing is that whatever we try to do in India runs into the proverbial rough weather. The first ever comprehensive preservation programme for books published in India initiated in 1990 was the Microfilming of Indian Publications (MIP) Project. It was intended to create a machine-readable bibliographic database of the entries of the five-volume *National Bibliography of Indian Literature* sponsored by the Sahitya Akademi in the early 1950s, and to microfilm the books (numbering about 55,000) listed in NBIL available in a number of libraries including the National Library. According to Subhas C Biswas, a former President of the Indian Library Association and himself a distinguished librarian, who was associated with the MIP Project, the "original plan to start microfilming with the National Library collection went through rough weather right from the beginning, due to some feelings of reservation among the library staff".*

5. CONCLUDING THOUGHTS

In several places of this presentation, I have mentioned about the need of our academic and researcher community to take active interest in developing and preserving the archival resources. The scholarly information contained in such documents is created, among others, by the community of scholars themselves. They are also the major consumers of this information. I strongly believe that unless they are curious about their own roles and rights as consumers, they only stand to loose. At individual levels the librarians have very good" rapport with their clients. In many organizations, they help the libraries in strengthening their library collections. The academics more often than not acknowledge the support of the libraries in their research work which is evident from the prefaces of their publications. However, there is hardly any interaction between them at organizational levels. It is absolutely necessary that the professional, organizations of librarians and those of these academics,

* See, Subhas C Biswas, "Indian Libraries — Book Preservation and Technology". [To be published in the Dr. S. M. Ganguly Commemorative Volume, by New Age (Kolkata). Significantly, James Nye referring to the project in his interview with *Frontline*, said that it, "started in 1990 and ended in 2000", but indicated that he would not talk about why and how it ended. He however, added, "we were making good progress.... We also realised the need to build human infrastructure in India. We accomplished the task of microfilming about 25,000 titles in the Bibliography before we had to end it". (*Frontline* January 17, 2003).

such as the Indian History Congress get opportunities to discuss the problems. The collective voice of librarians, archivists and academics will then be heard by the powers that be. Further, they need to have a dialogue also with computer scientists who make digital preservation possible make them to understand their view points.*

* Claire Tristram quotes a very interesting observatioo of a researcher in history: "Computer scientists are in a profession where there is virtually no need for historical infonnation. They don't need infonnation from the 1650s or the 1940s. They are used things superseding what came before. For those in the hwnanities, there is no such notion. They work by accumulation, not replacement". Tristram comments that " ...it's far more common for programmers to want to improve upon the past. That's the goal that keep computer science advancing at an exponential rate, and it probably explains why the technical problem of preserving the past has received so little attention from those who helped create the problem in the first place"! (*Technology Review* October, 2002. p. 40).

Abstract : The article expresses great concern about the way hard copy documents are being preserved or being destroyed in the process of preservation. The digital presentation, so strongly advocated from man corners has several crucial drawbacks; life span of CD's is not clearly known, technology changes rapidly, for quick digital presentation the hard copy is destroyed. The author points out that in preservation there are two sides — one is the conservation of the material carrying information and the other is the preservation of the information content. Author emphasises that both should be taken care of. Author also discusses different attempts at preservation of documents in India.

Destroy to Preserve : The Librarian's Dilemma

HIMADRI BHATTACHARYA*

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In 1996, the British Library decided to discard its huge stock of foreign newspapers. About 60,000 volumes were slated to be dumped which mostly comprised of all the non-commonwealth newspapers printed after 1850. The British Library decided to keep the microfilmed versions of these papers and get rid of the hardcopies and the decision was announced as an inside item in the newspaper library's newsletter "*Newspaper Library News 22 (Winter 1996-1997)*". In this context, it should be mentioned that English law requires the British Library to preserve all British newspapers in the original, but the foreign newspapers are not covered by the legislation.

The process of discarding began in 1997. More than 75 runs of Western European newspapers and periodicals were the first to go. Many were placed with national and university libraries of their respective countries (France, Belgium, Germany, Austria, Greece, Italy, Portugal, Spain, Netherlands, Switzerland). Those that had no takers were to be sold or literally thrown away. Next in the line were papers from Eastern Europe, South America and the USA. The British Library intimated the Library of Congress (LC) and the American Antiquarian Society (AAS), Massachusetts. The LC refused to take anything; the AAS took some titles. But the huge majority of US papers had no takers and the British Library decided to auction them off. The volumes, which would elicit no bids at the auction, were to be pulped.

It was at this point that Nicholson Baker arrived on the scene. Born in 1957, Baker is an American author of repute, having published five best-selling novels and two volumes of non-fiction. A regular contributor to periodicals, Baker, in 1994, published an article on card catalogues in *The New Yorker*. In it, he criticized the phasing-out of card catalogues in libraries the world over. In 1996, Baker wrote another article in *The*

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New Yorker about an incidence at the SanFrancisco Public Library in which the library decided to send "a few hundred thousand books to a landfill", simply because the "new library building was too small to hold them". These two articles gained Baker a repute of some sort as a "library activist" and it was this repute that prompted a person named Bill Blackbeard to contact Baker with the latest on newspaper dumping. Blackbeard himself was an old-newspaper collector and he recounted to Baker how the Library of Congress "had replaced most of its enormous collection of late-nineteenth-and-twentieth-century newspaper with microfilms". He also spoke of widespread discarding of books from research libraries all over the USA on grounds of "acidity and embrittlement". Baker was not much interested. About two years later, Baker met Blackbeard in person, more out of curiosity than with any intent. This meeting intrigued him somewhat and he began research into how stocks of old newspapers were maintained in US libraries, if at all. Thus began Baker's journey into the strange world of newspaper preservation in the US. What he found deeply disturbed him and his purported article on the subject slowly snowballed into a book that has provoked this article.

Double Fold : Libraries and the assault on paper[1] is a book about libraries, newspaper archiving and about the longevity of papers in general. Its vastness of scope is well illustrated by the fact that the Library of Congress Cataloguing-in-Publication Data for the book has come up with four subject-headings : 1. Libraries — United States — Special collections — Newspapers. 2. Newspaper and periodical libraries — United States. 3. Newspapers — Conservation and restoration. 4. Paper — Preservation — United States. But the essence of its contents is best encapsulated by its subtitle : "*Libraries and the assault on paper*". The term 'paper' here stands both for newspapers and for paper as a medium of recorded communication. The author's style is part reportage, part research work and at times narrative. This heterogeneity in style lends the work a high level of lucidity. It informs as well as entertains and at the same time makes the reader aware of a major issue regarding the preservation of our cultural heritage.

2

Although paper is the single most important medium in the process of mass dissemination of knowledge, no long-term study has been attempted to determine the chemical processes involved in the aging and degeneration of paper. The preferred method among scientists is the "artificial aging" or "accelerated aging" process where a paper sample

is baked in a laboratory for a week or two to simulate the natural aging process and then tested for the changes undergone. This method is arbitrary and non-standardized to say the least and no scientific evidence has yet been obtained to prove conclusively that oven-baking induces the exact chemical changes as natural aging or that so-and-so hours of baking simulates such-and-such years of aging.

Till 1870, the chief papermaking ingredient in the USA was cooked rag. Rags were imported from twenty countries, but most came from Italy. Rag-paper was much more durable than wood-pulp paper. But the demand of paper reached such a proportion that it became impossible to feed the paper mills with rags alone. Various alternatives were tried, but ground wood-pulp worked the best. Moreover, it lowered the production cost and gave cheap paper. Unfortunately wood-pulp paper had the "inherent vice" of having a low pH value. This acidity, according to experts, made paper discoloured, brittle and prone to crumbling. This is exactly the point the author refutes. He cites various authorities and narrates personal anecdotes to demonstrate that although wood-pulp paper discolours and becomes brittle early, the process stops at a certain point and thereafter the paper stabilizes. It does not fall apart spontaneously, unless abused. And Baker does furnish a litany of abuses to paper meted out by US libraries! He dwells at length on the process of microfilming and the accompanying doom it spelled on hardcopies. From around 1950, the Library of Congress decided to microfilm all its newspaper collection. Bound volumes of rare and old newspapers were microfilmed and the hardcopies were discarded *en masse*. The LC also stopped "the binding and storing of many new newspapers: incoming papers were dumped after a few months as soon as commercial microfilm arrived to put in their place" (p. 32). Baker accuses, "none of this epochal activity, in which the Library of Congress began its slow betrayal of an unknowing nation, was published in contemporary annual reports" (p. 32).

Microfilms save space, provide accessible duplicates of rare materials and facilitate long-term preservation. These were the reasons why microforms became an instant hit with librarians in the mid-twentieth century. But Baker rightly points out a plethora of disadvantages. It is expensive. Its resolution is of poor quality and it distorts colour reproductions. It has to be viewed through a reader and hence users loose interest to browse. Some users even experience eyestrain and accompanying nausea. Baker mentions, "at the Archives of Ontario, one of the microfilm readers had an air-sickness bag taped to it" (p. 40)! Moreover, newspapers were not easy to browse on microfilms. The illustrations would simply not come through with the same fervour.

With all its disadvantages, microfilms still had its plus points. If only the libraries kept the microfilms as a standby and preserved the original hardcopies, there would have been nothing to complain. In reality, the hardcopies were being totally discarded. Apart from losing a piece of documented history and the obvious artifactual value of old newspapers, substituting newspaper collections with microfilms posed some typical problems. One of them is the "Ace Comb Effect". As Baker explains, "Does microfilm successfully capture the text of the thing it locally replaces? No, often it doesn't, because big-city papers published five or ten or more editions (or 'replates') throughout a given day, and most libraries simply bound whichever ones they happened to be sent" (p. 47). This means microfilming one particular newspaper issue and discarding all issues of the same day poses the risk of losing some information contained in variant editions of that issue forever. Another risk is that of the microfilmed run being incomplete itself. This may be because the original volume lacked issues or pages, or even because the microfilm technicians skipped pages by mistake. Strangely enough, the Library of Congress deemed a microfilmed run of newspaper to be complete if "only a few issues per month are missing". Baker points out, "taking 'a few' to mean 'two' (conservatively), a microfilm is all there, for the Library of Congress's purposes, even when more than six per cent of it *isn't* there" (p. 52).

And then there is the process of microfilming. In the US, volumes to be microfilmed are disbound; their pages singled out, and then filmed. Originally undertaken to avoid gutter-shadow in the microfilm, this process actually speeds up production and cuts down cost. The disbound sheets are hard to restore and are usually discarded. This savage method could well have been avoided as European nations carry out microfilming without disbinding. Ironically, if there are two copies of a document — one brittle and the other in good condition — it is usually the better volume that is disbounded for microfilming since "it is substantially cheaper to scan a book if the paper is strong...." (p. 69). Here lies Baker's argument. If libraries are entrusted with the task of safekeeping a nation's cultural heritage, is it not their duty to safekeep at least one hardcopy of each and every document of any consequence? And newspapers are one of the most important primary sources of modern history. According to Baker, the Library of Congress has successfully got rid of the last extant hardcopies of some of the most important newspaper volumes. The major research libraries throughout the US had followed suit and replaced the paper copies with microfilms. Since it is hard to detect defects in a roll of microfilm at the time of purchase

(no one is going to scan through every single page of say a 70 year run of a newspaper!) we do not even know how much is already lost in the process.

3

Apart from microfilming, the other craze that took over the library world in the 1950s is mass deacidification. Wood-pulp paper is inherently acidic due to the use of alum-rosin additive. This is mixed in the pulp vat and is known as 'vat sizing'.This additive helps in fixing the ink but produces abeitic acid and sulphuric acid, which react over time and weaken the fibrous mat of cellulose that make up the bulk of paper. William James Barrow, the inventor of the Barrow-process of lamination, is considered the father of modern mass-deacidification. With the patronage of the innovative Chief Assistant Librarian of Congress, Verner W. Clapp, Barrow developed a process in which books were packed in vacuum chambers and gassed with an alkalysing vapour which neutralised the pH value and also acted as an 'alkaline buffer' to prevent any future acidity. The active ingredient used in this process was diethyl zinc or DEZ. It is a pyrophoric substance, which means it bursts into flames on contact with air, and hence is highly dangerous. It was primarily experimented with as a defense material and formally 'weaponized' by the US army. Its only civil use was in plastic factories and that too in highly diluted proportions. But the mass deacidification programme needed to handle "hundreds of pounds of" DEZ and that too undiluted. Though the experiments were run at NASA's Goddard Space Flight Center, two explosions occurred on December, 1985 and February, 1986. NASA passed the buck as investigations revealed proper precautions were not undertaken. Even though the project was scrapped thousands of volumes were already deacidified. It is not yet known whether these books are totally rid of acid related dangers, but obvious damages were done to them in the process. Most were discoloured and partially burnt around the edges due to the pyrophoric effects of DEZ. No one knows what amount of taxpayer's money went into these futile researches. The author argues that the sum could have been well-spent on upgrading storage facilities and "the library's scientists could have spent those decades learning more about the chemistry and ageing characteristics of old paper rather than studying the behaviour of an exotic metal alkyl *on* old paper" (p. 137).

This takes us to the celebrated 'Double Fold' test, from which the book derives its title. Proposed by William J. Barrow, it is an arbitrary, yet widely prevalent, test performed to derive misguiding findings about

JCU 323/1)

the longevity of the paper of a given volume. In fact, it has become the single most important test to be performed on books to judge their longevity simply by evaluating how many reverse folds can the corner of a page withstand without breaking off. The author strongly condemns this practice and rightly points out that pages of books are not meant to be folded but to be turned. The pages of any old volume will give in if folded repeatedly, but may be turned without a hitch as many times as one wishes. In Chapter 14: *A New Test*, the author proposes that the turnability of a page, not its flexibility, should be regarded as an index of its usability "Would you check the resilience, and hence the utility, of a diving board by counting how many times you could fold it back on itself before it failed? No, you would not. In fact, a diving board that you could double-fold ten times might be an unacceptably floppy diving board" (p. 157).

4

Nicholson Baker thus takes the reader on a whirlwind tour of the world of library preservation. He wonders that in library parlance, 'conservation' and 'preservation' are no longer synonymous. While 'conservation' refers to the repair or restoration of the original object, 'preservation' has, of late, come to mean reformatting the thought content and dumping the original document. Even in library pecking order, the conservation department is now subordinate to the preservation department. The book often reads like a thriller, specially at places where Baker points out the CIA connections of the Library of Congress, the Cold War and its fallouts on preservation, the researches undertaken by the US Department of Defense and their application in preservation of books, the misadventures with DEZ and more. It is interesting to learn that in the late nineteenth century, when the US rag-paper industry faced acute shortage of rags, linens stripped from Egyptian mummies were shipped from Egypt and used for this purpose (Chapter 6: *Virgin Mummies*). The reader will be thrilled to learn, on the aside, that on the first locomotive run in Egypt, mummies were used for fuelling the steam engines (p. 59). This chapter on mummies, though immensely interesting, is somewhat irrelevant to the overall scheme of this book.

Tales of torture on paper abounds throughout this volume. We come to know that the enigmatic Fremont Rider performed "full-cropping" on wide-margined books by "slicing off their tops, bottoms, and fore-edges—cover-boards and all—so as not to store forever a lot of accompanying waste paper" (p. 83). It is equally disturbing to learn what happens to the bound volumes of old newspapers discarded by

the US libraries. It is against US law to give them away to individuals. If no institution wants them, they are sold off to dealers. They disbind them and sell loose issues to individuals, at a premium, mostly as an "original keepsake newspaper" from the day a loved one was born (p. 19)! The reader also learns about the oversewing method of binding employed by libraries throughout the twentieth century that destroys the original publisher's binding and damages the leaves in the long run.

Baker writes about "*Slow Fires*", the acclaimed documentary on self-crumbling acidic books, which, according to him, is nothing but an elaborate propaganda. No one has actually seen a book spontaneously crumble, he argues. He believes that the authorities in charge of the Library of Congress cooked up an environment of impending crisis and made the Congress release large amount of funds through the National Endowment for the Humanities and its two subsidiaries — the US Newspaper Program and the Brittle Books Program. Librarians just craved to go hi-tech, he feels. And this did produce strange but lamentable results. Baker writes of a research library that has a vast collection of books on Joseph Pulitzer — the man who changed the face of American journalism. Ironically, this library does not posses a single original issue of the "*World*"—the newspaper that was the vehicle of Pulitzer's achievements. Once they were all there; currently microfilms have replaced them.

The author is not unbiased in approach. In his own words: "This isn't an impartial piece of reporting. I've tried not to misrepresent those whose views differ from my own, but I make no secret of my disagreement; at times, a dormant persecutional urge awoke in me, for we have lost things that we can never get back" (p. x). It is natural then, that Baker's story has its own villains: Verner W. Clapp, Peter G. Sparks, William J. Barrow, Fremont Rider, Patricia Battin ...the list is long! All of them are highly respected names in their field. But Baker is not paranoid. He states facts and lets the reader judge.

5

Not until we reach the last chapter do we realize that Baker is no empty preacher. In the course of his enquiries he realized that the Library of Congress has long discarded its own holdings of the rare US newspapers in original, which the British Library was auctioning off. When all attempts to stop the auction failed, Baker formed a non-profit organization called the American Newspaper Repository, with his mother, father and wife on the board of trustees—and placed a bid of $50,000. The organization was necessary since individuals were not allowed to bid. The $50,000

came from Baker liquidating one of his two retirement accounts! The deadline for placing bids was September 30, 1999. His offer prevailed for some newspapers including the *New York World*, the *Herald Tribune* and 90 other titles, but failed for *Chicago Tribune*, *The New York Times* and about 30 other titles. Most of these went to an US dealer of old papers. Baker purchased the *Chicago Tribune* from him for another $63,000. The equivalent microfilm would cost about $177,000! Writes Baker; "We're at a bizarre moment in history, when you can have the real thing for considerably less than it would cost to buy a set of crummy black-and-white snapshots of it which you can't read without the help of machine". Baker subsequently also purchased *The New York Times* run (1915-1958) for $56,000. Thus, he ultimately purchased 11,100 volumes of bound US newspapers, almost none of which are now available in US libraries in original.

One cannot resist the temptation of quoting the last paragraph :

> "May be someday a research library will want to take responsibility for these things, or may be not — whatever happens, at least they aren't going to be cut up and sold as birthday presents. Sometimes I'm a little stunned to think that I've become a newspaper librarian, more or less, and have the job of watching over this majestic, pulp-begotten ancestral stockpile. And of course I worry about running out of money, and about devoting months and years of my life, and of my wife's life, to this effort. But at the moment nobody else seems to want to do what must be done. Six thousand square feet of space near where I live, with room to shelve all the papers and to hold a small reading room, costs about twenty-six thousand dollars a year to rent — about the salary of one microfilm technician. That seems cheap to preserve more than a century's worth of inherent vice, and virtue" (p. 269).

This single-handed attempt to preserve one's heritage with almost missionary zeal could well be a source of inspiration to the rest of humanity.

6

This book indirectly raises yet again a few fundamental questions long debated by twentieth century librarians. Should libraries be repositories

of hard copies? Or should they try to provide access only to the intellectual content of documents? Should space problem be uppermost on the mind of the national library of a country while considering preservation of cultural heritage? Is it really not feasible to arrange low-cost off-site storage in warehouse sheds? After all, most newspapers and several books do have artifactual value and centuries later researchers will certainly want to lay their hands upon original hardcopies purely for this value. How else would they gain first hand knowledge of the paper, printing ink, binding techniques and even illustrations used in the past? Upon whom, then, does the responsibility of storing at least one hardcopy of every document of consequence rest, if not upon librarians? Then there is the issue of using questionable methods in the name of preservation without seriously considering their long-term consequences. A lot of preservation people Baker interviewed maintained they, after all, are trying their best to save the documents. True; but as Baker says, "when trying does far more harm than not trying, don't try. Go slow. Keep what you have" (p. 260). Baker's case is well made and as the blurb on the back cover proclaims, quoting an extract from "*Kirkus Reviews*", "If even half of what Baker alleges is true, some of America's most honored librarians have a lot of explaining to do".

What bearing does all this have on the Indian context? A lot, if we heed the warning in it. It is often the fate of developing nations to import ideas and techniques *per se* from developed societies. In many a case these ideas and techniques are either not chiselled to perfection or are not suited to the conditions prevalent in the nation that adopts it. And when the nation where the technique originated improves upon it, the borrower nation can neither afford the advanced technique nor discard the outdated one. Standing on such perilous grounds, we should better heed the words of caution Baker pronounces and give second thoughts to our policies on preservation and storage of library materials. Not often does one come across opportunities of learning from other's mistakes—and here is one!

The book contains endnotes spanning from pages 271 to 334. These are an elaborate source of information. But the textual portion has no indicative marking or numbering to alert the reader when to look for a note. It is understandable that the author avoided footnotes to make the book an easy read. Also, the notes are far too abundant to be printed as footnotes on every page. Still, the present layout makes it difficult for the reader to correlate a note to its relevant text-block. The bibliographical references span 19 pages in small typeface and contains an amazing list of documents on storage and preservation of

paper. There is a 17 page relative index too. The volume is tastefully designed and handsomely bound. And yes, a declaration on the verso of the title page proclaims that it is printed on acid-free paper!

Reference :

All quotations used in this article have been taken from BAKER (Nicholson). Double Fold : libraries and the assault on paper. 2001. Random House. New York.

Abstract **:** Provoked by Nicholson Baker's book on newspaper preservation and deacidification programs undertaken by the library of Congress, this article captures a bird's-eye view of the world of microfilming and preservation of newspapers. The inherent acidity of wood-pulp paper led to the presumption that documents printed on them inherit a very short shelf-life. US librarians began replacing all original bound volumes of old newspapers with microfilms which were incomplete themselves. The process of microfilming, too, caused much damaged since it involved disbinding of well-preserved bound volumes of newspapers which were later discarded. The mass deacidification program using DEZ left numerous Double Fold test initiated by W.J. Barrow is regarded as the single must important test of longevity of paper. Baker points out its drawbacks and proposes the turnability, not the flexibility, of paper to be considered as an indicator of its longevity. He accuses the library of congress of cooking up an environment of impending crisis and destroying valuable hard copies in the name of preservation. Baker's own effort in rescuing 11,000 volumes of bound US newspapers at the expense of personal money and every is inspirational. Developing nations should be careful in choosing preservation strategies and must try to learn from the pitfalls encountered by advanced nations.

Manpower planning in academic library with special reference to Non-Government college library staff pattern

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ACADEMIC LIBRARY, MANPOWER AND THE NEW MILLENNIUM

Role and mode of functioning, all has been changed during the last couple of decades for all types of library and information center and so as for academic library systems. Trend will be same in future couple of decades also. The fundamental problem is also substantiate that all form of higher or further education are facing with a vast expansion in the amount of knowledge, in the quantity of documents, medium of informational sources, methodology of teaching and learning process, as well as in the numbers of students. In consequence, in order to examine as a truly library and information service, the circumstances are obliging to adopt an appropriate approach in all sphere of activities and aspects of the library systems in general and academic libraries in special. We can identify the recent developments, which are the indication of the new millennium as far as the academic libraries are concerned:

1. Growth of students in numbers.
2. Decline in library expenditure.
3. Increased prices.
4. Changes in the make-up of the students' populations.
5. Changes in the course design.
6. Changes in teaching & learning methods.
7. Increasing focus on needs of users.
8. Decline in students book purchasing.
9. Development of IT .

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The academic library needed to be cope with the changes to adjust with the perceptions of such a 'new millennium' as it serves more as an 'achievement reading' purposes. Landheer in his book "The Social Function Of Libraries" distinguished four types of reading: achievement reading, devotional reading, cultural reading and compensatory reading (Benge, 1970, p 23.). The teaching learning societies more or less fall under that 'achievement reading' group.

Now a days the college library may also be regarded as 'a client centered system' (Pack, Peter. J, 1988, p. 60). Pack in his book mentioned staff as the most important resources besides learning materials; equipment, accommodations and furniture; which on the other hand may be considered most influential input factor in the system. Academic library needs in the new millennium not a passive human but proactive personal to provide effective services.

One of the most influential pieces of factors on the declining of quality services focuses on the perceptions and expectation of customers and on the dimension of services which customers employ in evaluating service quality of services (Jordan, 1988, p 17). Regarding quality service as required for library & information services it should be:

Tangibles : appearance of physical facilities, equipments, Personnel, and communication materials.

Reliability : ability to perform the promised services dependably and accurately

Assurance : knowledge and courtesy of employees and their ability to convey trust and confidence.

Empathy : caring, individualize attention- the firm provides its customers. (Zeithannal, Valerie A et. al. 1990, p 26)

The first two factors mentioned above are relates stuffing structure and communication channels. Most of the academic libraries have mainly hierarchical and pyramidal structures. But whatever may be the structure the need of the time is to act as a 'team'. A derived definition of a team is 'a group in which the individuals have a common aim and in which the jobs and skills of each members fit in with those others' (Bulk, 1996, p. 87-104).

As far as management of academic library in new millennium is concerned the Total Quality Management (TQM) should be implemented and 'already in TQM, focus shifted from products and process to customers and employees....' (Sen, S. K, 2001). It also be important that considering changing scenario 'the Govt. policy on manpower planning, the professional education and training and the attitude of information workers towards works' (Jones, N and Jordan, P, 1982, p 2) besides other factors like

structural changes, teaching learning methods, socio-economic-political and technological trends, expanding/recessive economy are found to be effective in an academic library environment

MODEL MAN POWER PLANNING

What will be the exact staff pattern to fulfill the aspirations mentioned above, as far as their strength, knowledge and skills are concerned? Because staffs are in a vital role position in order to provide 'right information, at the right time to the right persons'. Normally staff pattern depends on the one hand on the nature of the library to be managed and on the other hand the nature and volume of its users and services to be provided. The policy on staff pattern may not maintained only by 'as it need' but 'as you able to feed' concept in a particular socio-economic condition. As Dr. Seetharama (1985 p F2) said, each country can adopt the appropriate path to suit its own socio-economic policies, resources and capabilities". In regards of planning a library and information system, he expressed that a developing country need not necessarily go through the many stages that some of the developed countries had taken.

Dr. S. R. Ranganathan (1959, p 28) listed three categories of staff are to be allotted for academic libraries: (1) Professional staff (2) Non-professional skilled staff (3) Unskilled staff. Whereas Seetharama (1985, p F3) has suggested only two categories of personnel: (1) Professional staff, and (2) Support staff. He also suggested (1985, F15) the criteria in the context of staff development policy that the objective should be to allot appropriate work forces to meet the requirements of specific duties.

Dr. Ranganathan (1959, p 28) prescribed formulae for academic library in an exhaustive nature. He suggested '....formulae for the staff of library interests in terms of work'. He listed 10 factors to measure the volume of 'out-tern' of work :

Factors related to documents and documentation :

- No of volumes in the library
- No of volumes accessioned in a year
- No of periodicals currently taken
- No of periodicals documented-that is abstracted and indexed in a year.

Factors related to time period :

- No of working days in a year
- No of gate hours. (One gate hour = one counter gate kept open for one hour).
- No of hours the library is kept open in a day.

Factors related to readers :

- No of readers per day
- No of seats for readers.

Factors related to annual budget

He also identified sections for which persons should be required as per formula

- Librarian and his deputies
- Persons in book section.
- Persons in technical section.
- Persons in periodical section
- Persons in maintenance section.
- Persons in circulation section.
- Persons in reference section.

He also gave the formula separately for total professional staff, total non-professional skilled staff and total unskilled staff (see annexure for actual formula). Seetharama's (1985, F18) view is that the persons for administrative and auxiliary service (non- professional staff, such as for cleaning, watch and ward etc.) might be draw up from a common pool and in that case the manpower requirement may be adjusted accordingly.

Seethanama also prescribed model staff formula (in his word - simplified staff formula) (Seethanama, 1985, F6). Setharama's formula is same as section 2 to 7 in Ranganathan's formula but he added two more sections, such as information services section and supervisory staff (though his formula mainly designed for information center). The library associations' 1991 guidelines for college and polytechnic libraries mentioned the students staff ratio, should be one library staff member is to 115-125 students (Jordon, 1998, p-88).

THE ACADEMIC INSTITUTION AND LIBRARIES IN WEST BENGAL

The models of educational institutes in our country are made after Western European model. Western learning and educational systems started in this country spreading by the 18th century. Three universities were established in 1857 at Kolkata, Chennai and Mumbai. In 1857 there were only 11 colleges. Within the present jurisdiction of WB 'of them eight are still in existence' (S. K. Sen, 2000). In 1947 after the partition of India there were only one university and 73 under graduate colleges. Because of the rapid expansion of the school education in the state now (March, 2000) the number of colleges are 419.

The concept of libraries as we understand it now is also an imported

one from Western Europe. This is quite obvious. Enlightened natives from early 18th century developed libraries in India primarily as private collections of enlightened colonialists. The institutional libraries started growing along with institutions. Many of the colleges and schools particularly the old poly-lithic colleges amassed huge collection, sometimes supplemented by gifts or personal collections. But currently most of the libraries suffering so many problems besides finance, space, organizational, administrative and especially with problems arises from pattern of staff or so-called manpower planning.

EXISTING STAFF PATTERN FOR NON-GOVERNMENT AFFILIATED COLLEGES

As early as in 1968 the then pay commission (popularly known as Hazra commission) appointed by the Government of W.B., recommended among other things that the numbers of volumes of stock may be only one of the criteria for determination of the number of staff in a college library. All the implemented staff patterns for college library formulated against the volumes of collection in a particular college library.

The current pattern is (WBCLA, 1997, p.132)

Book Strength	Librarian	Asst. Librarian	Library Clerk	Library Peon	Total
Up to 5000	0	1	0	1	2
5001-10000	0	1	1	1	3
10001-25000	1	1	1	1	4
25001 & Above	1	1	1	2	5

Figure-1: 1995 Staff Pattern

Above pattern of staff was imposed by the DPI vide circular dated 31st December 1995 in the name of the 'Rationalization of the Non-teaching Staff Pattern for non-govt. colleges'. Other two staff patterns are these given below:

Book Strength	Librarian	Asst. Librarian	Library Clerk	Library Peon	Total
Up to 10000	1	0	1	1	3
10001-20000	1	0	1	2	4
20001-40000	1	0	2	3	6
40001 & Above	1	1	4	4	10

Figure-2: 1986 Staff Pattern

Book Strength	Librarian	Asst. Librarian	Library Clerk	Library Peon	Total
Up to 5000	0	1	0	1	2
5001-10000	0	1	0	2	3
10001-25000	1	1	Lib. Asst.1	3 Lit	6
25001 & Above	1	1	2	4	8

Figure-3: 1978 Staff Pattern

All these patterns mentioned above based on only one criteria and obviously that is the number of collection, other relevant factors did not considered. Dynamics of library work dose not reflected in the formula. What are the reasons in formulating such a formula based on single criteria? Dose it true that the total no of collection fit with Ranganathans' fifth law that 'library is a growing organism'. In a narrower point of view one may claim "growing organism" means growing volumes in terms of only collection. Others may claim that number of volumes should satisfy Ist, 2nd, 3rd and 4th laws also. All of them demanded activities and services, which will narrow down the gaps between the documents and the users.

The number of books that collected shall be treated responsive to users if there is proper and dynamic manpower planning and only then the aspiration of new millennium shall be fulfilled.

The formulas mentioned above show that up to 5000 book strength the provision of total staff was 3, 3 and 2 respectively in 1978, 1986 and in 1995. In latest staff formula one person reduce. Against the strength of books 'above maximum limit' (either above 25000 or above 40000) the total staff varied as 8 to 10 and again to 5 in. In 1988 pattern the top extreme in regards of strength of book it was 40000 & above, but in other two cases it is 25000 & above, but in all three cases the maximum limit is unlimited. As far as numbers are concerned the formula of 1998 is comparatively better. In the 1995 staff pattern the total no of staffs against different numbers of effective book strength is comparatively reducing. Though the minimum effective strength lowered by 5000 from 10000, as it was in 1978's staff pattern.

Figure-4 : Comparative table of three staff pattern

Another most important factor that may be considered as sluggish to cater effective service by the 'team' of library staff and that is there are no single person other than librarian/Assistant librarian has or needed to have any training in library and informational work. For the top most

composition in the library staff hierarchy they should have the highest professional degree but after that there is no provision that they should have any such degree. No one could deny that the whole activities in an library and informational work involved mostly the intellectual efforts and activities whether it is a traditional library or the modern one. As far as the professional degrees are concerned there are only a single tier , no hierarchy. As a whole the 'team' is not prudent with composition of effective professional skills.

The post of library clerk may consider in the category of Non-professional skilled staff. But in a college library there are lot of professional and/or technical works to do rather than mere clerical one. A person with professional degree in place of library clerk designation could be an effective in the 'team'. It is interesting to note that many of college authorities believes unofficially that the staff recruited for library such as library clerk, library peon do not need to work in the library but they should assigned elsewhere where there are shortage of staff.

Book Strength	Provision of total number of staff in different staff patterns		
	1978	1986	1995
Up to 5000	3	3	2
Up to 10000	4	4	3
Up to 25000	5	6	4
Above 25000	8	10	5

EXISTING STAFF PATTERN AND VIEWS OF THE PROFESSIONAL ORGANIZATION AND ASSOCIATION

West Bengal College Librarians' Association (WBCLA) and Bengal Library Association (BLA) are of two Association working among the professionals. WBCLA is exclusively for Non-Government college librarians in West Bengal; BLA is working for public libraries and others. Both the organization has their views on the existing pattern and suggestions. Though no one has prescribed the exact formula to be adopted in the college libraries. They prescribed what should be the criteria or basis (at least I could not found anything like that).

Both the organization are against the basis of existing formula and their designation and qualification. As per their views there should be persons with professional/technical hand below the Assistant Librarian. They are opposing vehemently the basis or criteria against which the

number of staff calculated by the Directorate of Public Instruction (DPI). After publication and implementation of 1986's staff pattern WBCLA registered their protest against the basis of staff formula and that is only book strength and other relevant issues for the determination of the number of staff. Their alternative suggestion (Bhattacharya, A N, 1985, p. 32) regarding the criteria of staff strength was Number and composition of the clientele served both student and staff-teaching and non-teaching;

- Number and nature of collection of the library;
- Numbers of Faculties with/without Hons. Facility;
- Nature of services rendered by the staff;
- Number of annual acquisition (both books and journals) other than those acquired against UGC grants;
- Nature of library building, i.e. layout of physical condition of the library building;
- Working hours.

In their words the imposition of an inadequate number of staff and at the same time the demand for standard services endurable by a college library is not at all compatible with the *principal* of model staff pattern.

Although the scope and functions of a college library are dependent to a great extent on the nature and size of its collection as well as clientele, there is no denying the fact that they are equally dependent on the intellectual equipment and professional competence of its staff, and above all on the policy of recruitment of the professional staff.

SOME STATISTICS COMPILED THROUGH A SURVEY DONE AMONG THE NON-GOVT. COLLEGE LIBRARIANS

A survey has done among a small number of responders during the period of time of the Refresher Course held in Sept. 2001; obviously all the responders are Non-Govt. college librarian/Asst. Librarian. A short questionnaire has been prepared for the purpose of collection of data and compiled those accordingly. Out of 18 Non-Govt. college librarian participants 17 contributed information regarding their college libraries; some of the findings are discussed below. There is only one college with book strength with up to 5000 books. The number of colleges with book strength above 25000 is the highest and their percentage is 41.17; 23.52% of libraries have books within the range of 5001 to 10000 and 29.41% of libraries have 10001 to 25000 books. If we project this ratio on total 340 non-Govt. college libraries the figure will be as follows:

Book Strength	Percentage of colleges	Projection on total 340 Non-Govt. Colleges	Age of the Collegs	
			Mean age (yrs.)	Median age (yrs.)
Up to 5000	05.88%	20	—	—
5001-10000	23.52%	80	33	31
10001-25000	29.41%	100	37	35
Above 25000	41.17%	140	51	51
Total	99.98%	340	—	—

Figure 5: Percentage of colleges according to their book strength and age of the colleges.

Among the book strength of above 25000 group, there are 14.30% of libraries have books below 30000; there are 42.85% of libraries have 30000 to 40000 and the percentage of libraries have strength of above 40000 books is also 42.85.

As far as the age of the colleges are concerned we got 46.8% of libraries with age of 26 to 50 years, then 23.4% with 51 to 75 years. Ages of 17.6% colleges are up to 25 years and 11.7% colleges are above 75 years.

Book Strength	Average No of Staff	Average No of Hons.	Satisfaction Point 'N'	Satisfaction Point 'E'
Up to 5000	—	2	6.00	2.00
5001-10000	3.5	3	4.25	6.25
10001-25000	4.0	6	6.40	5.60
Avove 25000	5.0	11	6.14	5.57
Total	4.16	—	5.76	5.53

Figure 6: Average No of staff, Hons subject and satisfaction level according to the strength of books of the libraries surveyed.

Above table shows that the average staff available in the colleges with book strength of above 25000 is highest and exactly same to the number of staff should be as per existing staff pattern (Fig. 1). If we compare book strength, age of the institution and number of honours in the colleges surveyed we will find a correlation among themselves; more the age of the colleges with more the number of books with more number of honours subject taught in those colleges.

Most interesting findings are regarding satisfaction level of the college librarians with the team available' (actual staff available in the college library) considering on the one hand only number of the staff and on the other hand considering the knowledge, skill and experience of the 'team' as a whole. In the table given above (Fig. 6) satisfaction point 'N' means assessment upon a ten point scale how the 'team available' in your college is effective considering the number of person in the 'team'; satisfaction point 'E' means similar assessment considering the knowledge, skill and experiences as a whole of the 'team'. In all cases satisfaction point 'E' is less than the satisfaction point 'N' except in case when the libraries having book strength of 5001-10000. In both the cases of satisfaction the average point is more than 50%, but far away to reach a complete satisfaction. As it is true that only the average can not speak true, then we have to test the level of fluctuation (if any) around the central tendency of any observation. The Standard Deviation of satisfaction point 'N' is 1.47 and 1.84 in case of satisfaction point 'E'. The assessment considering the number of 'team' member is less fluctuating than the assessment considering their knowledge, skill and experience.

CONCLUSION

Staff pattern, as well there composition as far as number and qualification are concerned is one of the most important and complex state of matter. Pattern of staff, basis of its formula, the eligibility should be reviewed immediately. The formula should be based on dynamic characteristics of the academic library especially in the context of new millennium, but all so-called criteria mentioned by various authors and demanded from many corner of professional organizations may not be possible to take into practical consideration. It should also be reviewed that why there are no other technical staff except the librarian/assistant librarian. There is a demand from West Bengal Govt. College Librarians that 'library be treated as separate department of the college' (WBGCT A, August, 2001), There should be a consensus between theory and practice, need and reality. Future of services of the libraries also depends on the so-called or so-demanded 'status' of the librarian in the frame work of statutory provision, but in similar dimension the 'librarians' should maintained themselves 'librarian', no less no more as far as social recognition is concerned as they are sill maintaining but some short of renewal of image may always welcome like any other context of life and society is concerned.

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Abstract : This article discusses the need for manpower planning in Academic Libraries in West Bengal. Model manpower planning, existing staff pattern for non-government affiliated colleges, views of the professional organisations and some statistical data based on a survey have been depicted here.

Standard for Information Retrieval : A Review of Z39.50

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INTRODUCTION

With the advancement of technology in the 1980s and 1990s, co-operative bibliographic and information retrieval networks became crucial and of paramount importance. The development of online bibliographic database, such as PsycINFO and MEDLINE and the explosion of online services accessible on the Internet and World Wide Web (WWW) has made it possible for librarians and users to access information in ways not possible before. As electronic resources grow so will the problem at how to access the information of so many disparate systems. The problem not only involves the level of the user but also the ability of different database management structures and different application designs of information exchange.

The information needs of both the users and the systems demonstrate the current need for new standards to answer interoperability issues among so many different systems, bibliographic and otherwise. Exchanging bibliographic information among LC, OCLC and the like is no longer enough when so much information is available in electronic form only. The need for standards for communicating computer-to-computer became obvious in the 1980s with the explosion of technology. Having such standards with the ability to achieve transparent connections among systems would make it possible to search databases and retrieve information from any system no matter the differences in software or hardware on which it runs. There also would not be the need for private agreements to establish how a session would operate, unlike the agreements needed for the sharing of MARK tapes, and what protocols they would support. With such standards, a national and international information network could be realized through true interoperability

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making issues of software, hardware and data content obsolete. ANSI/ NISO Z39.50 developed out of the need to share bibliographic information electronically, but it developed beyond bibliographic information to a standard for information retrieval. Although there remains issues of implementation and interoperability, Z30.50 is one step advance towards a co-operative national information network.

BRIEF HISTORY OF Z39.50

Computers and telecommunications networks offer the potential to share data in electronic format. The challenge has been to develop a mechanism that would standardize communication between existing computer systems. NISO Organization (National Information Standard) responded to this challenge by establishing a standard committee in 1979 to work on an information retrieval protocol. This work culminated in Z39.50-1988. Beginning in the late 1970s funding by the Council on Library Resources (CLR) supported the development of an experimental protocol as part of the Linked System Project (LSP) for searching bibliographic databases and transferring records among the Library of Congress, the Online Computer Library Center (OCLC), the Research Libraries Group (RLG), and the Washington (now Western) Library Network (WLN). This Linked Systems Protocol laid the groundwork for the Z39.50 protocol.

After the approval of the standard in 1988, a group of Z39.50 implementers began work to enhance and expand the utility of the standard. Now it has gone through 3 (three) versions — in 1988 (V1), 1992 (V2) and 1995 (V3). Version 2 (1992) incorporated and became compatible with an ISO standard (10162/3) called Search and Retrieve. Version 3 in 1995 extended the features of the protocol. It is also incorporated with an ISO Standard known as ISO 23950.

WHAT IS Z39.50?

ANSI / NISO Z39.50 is the American National Standard Information Retrieval Application Service Definition and Protocol Specification for Open Systems Interconnection. The national Information standards Organisation (NISO), an American National Standards Institution (ANSI) accredited standards developer that serves the library, information and publishing communities, approved the original standard in 1988 (referred to as Z39.50 — 1988 or version 1).

The Z39.50 standard was developed by NISO to provide easy access to bibliographic and texrual information across different platforms of system architecture or command languages. The intention is to make it functionally easy to search and retrieve information wherever it may exist.

The Z39.50 standard is based on the client server architecture. A client is a requester of information, while a server is a provider of information. A client knows what it wants, while the server knows what it has and how to provide the information requested. The Z39.50 standard was therefore developed to enable a client system to locate and retrieve information from other server systems.

HOW DOES Z39.50 WORK? HOW DOES IT ACHIEVE INTEROPERABILITY?

Z39.50 recognizes that information retrieval consists of tow primary components—selection of information based upon zone criteria and retrieval of that information, and it provides a common language for both activities. Z39.50 standardizes the manner in which the client and the server communicate and interoperate even when there are differences between computer systems, search engines and databases.

Interoperability is achieved through standardization of

1. **Codifying Mechanics**—a standard way of encoding the data for shipment along the wire, and
2. **Content Semantics**—a standard data model with stared semantic knowledge for specific communities to allow interoperable searching and retrieval within each of these domains.

SOME DETAILS

A fun appreciation of the possibilities of Z39.50 comes from understanding what it can do. Some of the more important features are listed here.

SEARCH FEATURES

The latest version of Z39.50 (V.3 1995), allows extremely powerful search statements to be defined including:

Complex Boolean statements involving an the standard operators AND, OR, NOT Comparison operators for dates e.g. Greater than, equal to etc. Proximity searching Truncation Completeness i.e. part of field, complete field etc.

ADDITIONAL FEATURES

Searching. Z39.50 enables:

1. Authentication allowing the Z-server to control on who accesses the databases.
2. Accounting I resource control to allow access to be charged for.

3. "Explain" facility to allow information about the remote database services available etc. to be transmitted to the Z-client.
4. Index browsing as typically available in OPAC systems.
5. Defining record formats e.g. MARC format.

EXTENDED SERVICES

Version 3 also defines how to use the standard to implement what are called "Extended Services". These are not defined in the standard but may use Z39.50 as a control method. The types of tasks within the extended services area have been defined:

1. Save a result set for later use
1. Save a query for later use
2. Define a periodic search schedule
3. Order an item
4. Update a database
5. Create an export specification
6. The implications for libraries as systems begin to implement these and the basic services are profound

IMPLICATIONS FOR LIBRARIES

The implication for the library and information services are profound. Over the next few years, services will become "Z39.50 enabled" in much the same way that library OPACs have become "Web enabled". The process will be somewhat slower than the Wab revolution but more far reaching and structural. Some possible effects on library operations are explored here :

OPACs

Many OPACs have been Z39.50 for a few years now. This is the basic benefit of Z39.50 operation for a typical user. Access any and all of the world's major library catalogues or just the local sources with a single searc.

BIBLIOGRAPHIC RECORD SOURCING

Searching for and downloading bibliographic records using a Z39.50 tool is simple and very efficient since multiple sources can be searched simultaneously and records easily compared. Currently libraries are often "locked in" via service agreement and proprietary software to a bibliographic utility. A Z39.50 world will allow users to establish relationships with a variety of sources without penalties of complexity generated by different software. Resource control how much have I

spent? is built in to Z39.50 to make management easy. Note that the ease with which "free" records can be downloaded from libraries creates copyright issues that must be addressed. Again the mechanism for norifying a source library that a record has been used for cataloguing purposes is built into Z39.50 implementation is the real issue.

UNION CATALOGUES

Union catalogues—combined catalogues of several libraries — have been a valuable tool for decades within groups of otherwise separate libraries wanting to co-operate for inter-lending, co-operative purchase, and general reader service. They are, however, difficult and expensive to manage. Even using automated systems the co-ordination and maintenance required can be daunting from both an organisational and technical viewpoint. Using Z39.50 enabled catalogues and OPACs, a "virtual" union catalogue can be assembled without any changes to the individual organisation's methods and procedures. A user may sit at an OPAC screen and search several catalogues simultaneously as if they were one. Useful material and its location can be displayed with no additional work by library management apart from set-up of Z-clients. Ad-hoc groupings of libraries can be assembled to suit the needs of the users without any technical or administrative fuss. Colleges or companies suddenly merged or taken over, co-operative degrees, stock sharing schemes any scenario where it might be useful to have a consolidated view of library and information resources is simple to set up and administer.

INTER-LIBRARY LOAN (ILL)

The immediate benefit of a virtual union catalogue means that ILL is made easier the user can immediately identify the location of required items. The extended services of Z39.50 allows systems to arrange for the delivery, including account verification and billing, of an item to the enquirer. ILL services are currently either mostly manual or rely on disparate incompatible services from the large suppliers like OCLC and the British Library. In a Z39.50 enabled ILL future, libraries will be able to search and order items in one operation and deal directly with whichever library serves their needs all via their own library OPAC search tools.

CD-ROM ACCESS

Despite the steady migration of CD-ROM information providers to Web based services, CD networks will be a feature of library services for some time. Apart from the idiosyncratic means required to force CD-ROMs to a networkable state, there remains the practical problem, when using

them, of having to understand each different software interface and having to search each database separately. Using Z39.50, it would be possible to search each database using a single familiar interface and, additionally, several databases at the same time. Z39.50 also solves the problems of being able to use different clients e.g. Macs, UNIX Workstations—even dumb terminals could be used. The SilverPlatter ERL technology actually provides similar facilities—but it is a proprietary standard and of limited application outside the CD-ROM area.

SELECTIVE DISSEMINATION OF INFORMATION

Version 3 of Z39.50 allows the user to specify search statements to be saved and run at intervals. Thus the user may for instance identify useful libraries and information resources and set up SDI profiles using a single interface. Searches can be automatically run when required and the results downloaded from the database to a specified destination e.g. fax or e-mail. Z39.50 makes the much-vaunted Push Technology seem Stone Age in comparison.

COMMERCIAL INFORMATION DATABASES

Library catalogues are only a fraction of the searchable information available. There are hundreds of commercially available information service providers like Dialog, Lexis Nexis, FT Profile etc. These services allow very complex search statements and Z39.50 (version 3) contains equivalent search statements including proximity searching, term highlighting, image retrieval, individual chapter retrieval, specification of variant forms for downloading e.g. Word, Perfect etc. Accounting and authorisation controls are also built in. Again, by using Z39.50 protocols, the complexity of searching disparate databases can be reduced.

WEB SEARCHING AND FILTERING

Searching the Web is frustrating for some of the very reasons that Z39.50 was developed i.e. many different search engines and user interfaces. By adding an optional Z39.50 interface to Search Engines, much of the frustration and time wasting could be avoided. The much-discussed topic of filtering unwanted areas of Web content could be attacked through an extended service. Each library could set their own filter parameters on the Z39.50 client used to access the major Search Engines.

Given the rapid development and constant vying for competitive edge in the Web Search Engine arena Z39.50 silver technology has probably a low priority. As the benefits of Z39.50 begin to be appreciated by professionals, however, it will only need one Search Engine to add the feature and there will be an avalanche of followers. See also a paper from Index Data for a useful discussion of Z39.50 on the Web.

DATABASE UPDATES

Z39.50 is not just a search and relative tool as mentioned, extended services such as ILL are now being linked into the standard by leading companies. Another task type that may be used as an extended service is updating a database. Thus a Z-client may for example retrieve a record from a database, edit it and then send it back to update the database GeoCAT product from Geac illustrates this function nicely since it may be used as a standard tool with either the ADVANCE or PLUS Library Management systems.

Z39.50 PRODUCTS AND SYSTEMS

Z39.50 can be incorporated into all sorts of products and systems only a few of which are currently being exploited. Z39.50 can be implemented on any computer system and so opens the way for true "Interworking". Thus a Mac Z-client can access a UNIX and a Windows NT based system simultaneously and seamlessly. See the System Diagrams for sample implementations.

OPACs

Integrated into a Library Management System (LMS), a Z39.50 OPAC allows users to search the local library catalogue and also to select from a set of library defined external library catalogues. This is the commonest use for a Z-client. OPAC Z-clients can be on the desktop, on a local private LMS server or publicly available over the Internet. They can be built as Windows, UNIX, Java or Web clients independent of the systems that they are accessing. See the system diagrams for examples.

CATALOGUING AND OTHER CLIENTS

A cataloguing client normally communicates with the database in an LMS via a proprietary' piece of software and/or SQL. Geac's GeoCAT is the only example so far of a Z-client being used for catalogue update purposes. It works with Geac's Advance and Plus but could work with other systems in theory. By using a Z-client, it is possible to:

Use one cataloguing tool against several databases from different vendors. Update two databases at once. Catalogue items remotely over the Internet e.g. to catalogue collections before they are physically transferred. Notify a bibliographic utility that a record has been used rather than just viewed for accounting purposes.

Geac have also built extended services for accessing patron records so a user may request, look at account information, place ILL's etc. from a Web Z-client. Here the use of a Z-client is not apparent to the user but it has paid dividends to Geac since they have only one client to maintain against ADVANCE and PLUS.

PERSONAL BIBLIOGRAPHIC TOOLS

Several personal or stand alone Z39.50 clients are available as desktop tools for librarians and researchers whose local LMS does not have a Z39.50 capability. Book where, SLS PC Browser and ZNavigator are good examples. Reviews of these products appear in Biblio Tech Review.

Z-TECHNOLOGY PACKAGES

The first companies with Z-products were the large system suppliers like Ameritech, DRA, Innovative, Geac etc. They provided both Z-clients and Z-server packages with their systems and so if you run one of the big systems you are "in the club" as far as bibliographic records are concerned. But what about libraries with systems that don't have Z39.50 with special collections not on their main library system? One answer is to load a separate copy of your catalogue on a specialist Z-server database engine and buy a Z-client OPAC to view your own and any other databases. Combinations of Z-client and Z-server software are being marketed as "Z-Technology" packages now. They typically provide Z-server, database engine with loading and indexing routines, PC Z-clients and Web Z-clients. OCLC's SiteSearch is a good example of such technology.

ASSESSING PRODUCTS

The assessment of Z39.50 offerings is tricky because the standard allows for differences in the implementation during the initialisation phase the Z-client and Z-Server agree what they can offer each other before starting out on a "Z-Association". You need to do the same with a potential system supplier these are the questions you need to ask yourself and your supplier.

DOES THE PRODUCT HAVE BOTH Z-CLIENT AND Z-SERVER?

Do you need both Z-client and Z-Server? It is fairly simple to bolt on a Z-client to an OPAC but more difficult to add a Z-Server to a database engine. If all you want to do is to search other systems then a Z-Server may not be essential but think about future ILL add-ons and users wanting to access you over the Internet using their own personal Z39.50 clients e.g. BookWhere. Is the Z-client integrated with the OPAC? One of the advantages of a Z39.50 is that it can provide a seamless gateway to other systems. If you merely transfer from your OPAC interface to a Z39.50 interface then you lose one of the benefits you may as well buy a stand alone Z-client and provide a link to it.

What version of Z39.50 is being offered'? Version 3 has been out for 2 years and provides many more facilities for advanced retrieval and

extended services like ILL see part 2 of this article next month for details or check out the additional sources. If version 3 is being offered, get a list of the features supported. A product can be level 3 compliant yet offer none of the enhanced features. Check out accounting and access control on the Z-Server if you want to be able to charge for access to your database.

What is the development path for Z39.50? Is the product going to implement further features? Is there a "road map" for this development? Will ILL become Z39.50 compliant?

Is the Web OPAC Z39.50 capable? It may be that just the standard OPAC is Z39.50 compliant? Or just the Web OPAC? Or both? check it out.

How easy is it to set up? A Z-client requires the librarian to administer the Target addresses, database names often how the data is presented to the user. Check out how easy this is to do. See the reviews for Z-clients in Biblio Tech Review. Try out the free versions on the Web to get a feel of how they work.

If a new system doesn't have Z39.50 what do you do? Look at the stand alone Z-client like ZNavigator and BookWhere and look at ways that you can integrate them into your operations.

CONFIGURATIONS

The Z39.50 standard is a messaging standard between an "origin" (Z-client) and "target" (Z-server). It does not determine how systems will be built, how they will present information to the user and so on. Z39.50 systems have been put together in many ways to suit different needs.

PROBLEMS

It is easy to become enthusiastic about the capabilities of Z39.50 and the range of benefits it can bring in terms of library cooperation, reader services and systems integration. Make no mistake, Z39.50 compliant products will become the norm in a few years. However, there are some practical problems when using Z-clients that users need to be aware of. The problems revolve around the levels of service supported within and between the particular implementation of Z-client and Z-server and also the capabilities and implementation of the host library Management System (LMS).

When building a Z39.50 Z-client, the designer has to decide which version and which features to implement. The standard defines many facilities and it is not necessary to implement all of them. Differences between the facilities on Z-client and Z-Server are sorted out via a "negotiation" prior to a search taking place. However the exact nature

of the "discussion" is not usually relayed to the user interface and assumptions may be made about what can be achieved and what cannot. For example, a local search may routinely search personal authors and corporates in the same index. When applied to a remote Z-server, an author search may be personal authors only.

Combinations of such disparities and differences both in the version of the standard and in extended services supported are common. This means that not all of the pain has been taken out of accessing non-familiar databases. Use "foreign" databases with caution. As time goes on implementations are getting richer and great service benefits for libraries will accrue. A standard feature of the Z39.50 standard designed to cover the problem of mis-matching of services is the "Explain" facility that allows a Z-client to ask a Z-Server what services it provides. Future clients will ask servers what they can and cannot do and present a description to the user of the OPAC to help them manage their expectations of the search. For complex searching of some databases, users may always prefer to have the control and extra facilities of the original interface software rather than risk "losing something in the translation".

Z39.50 DEVELOPMENT AND MAINTENANCE

The NISO Standard Committee that originally created and wrote the first version of Z39.50 was disbanded after the standard was approved in 1988. In 1990, a group of Z39.50 implements formed the Z39.50 Implementers Group (ZIG). This voluntary group of implementers meet in open sessions approximately three times a year to discuss implementation issues, bring requirements for changes to the standard, work out the detailed specification, and come to agreements that will go into the draft standard. The ZIG uses a public electronic discussion list to discuss implementation and standards development issues between meetings.

When the draft standard is completed, it is NISO's responsibility to assure that ANSI procedures for balloting, consensus, due process, and other requirements are followed and that the final approved American National Standard is available for use.

TOOLS AND SOURCE CODE FOR Z39.50 IMPLEMENTATIONS

Several groups, organizations and commercial firms offer tools and other aids for people who are developing their own Z39.50 implementations. Client and Server software as well as Application Programming Interfaces (APIs) are available to provide Z39.50 connection for existing computer systems. The availability of source code has acted as a catalyst for increased Z39.50 implementation activity.

A number of these tools are in the public domain for use by noncommercial and commercial implementers (some restrictions may apply). These include Z39.50 origins and targets and APIs from the clearing house for Networked Discovery and Retrieval, Florida Center for Library Automation, the National Library of Canada and Stanford University.

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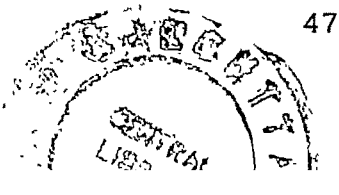
Abstract : ANSI/NISO Z39.50 is an open standard for information retrieval. It is a computer-to-computer communications protocol designed to support for searching and retrieval of information-full-text documents, bibliographic data, images, multimedia in a distributed network environment. Based on a client server architecture and operating over the Internet, the Z39.50 protocol is supporting an increasing number of applications fulfilling the searching demands of the emerging information age. The present article describes the essential elements and features and reviews the status of this standard.



Impact of Off-line and On-line Services on Libraries and Information Centres

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INTRODUCTION

The 1960s comprises the era of computer retrieval in an offline, batch processing, tape oriented mode. Bofore that no such conventional media was there for computer retrieval. After 1970s, we are in the era of on-line information retrieval system. These historical periods however are not quite as clear-cut. The first computer-based retrieval system was information in the 1950s. Nevertheless, the major off-line systems emerged in the 1960s, and the widespread conversion to the on-line mode of operation is a development of the 1970s.

1. OFF-LINE—WHAT IT IS

Off-line means for any media generally for computer, which is in a non-interactive mode. However, the PC user essential accessible dictionary defines off-line as "a printer or other peripheral that is not currently in ready mode and is therefore unavilable for use".

2. ADVANTAGES OF OFF-LINE SYSTEM

1. The ability to provide multiple access points conveniently and economically.
2. The ability to conduct many search simultaneously.
3. The ability to generate printed output including interfaces with devices for photo composition and for computer output microform.

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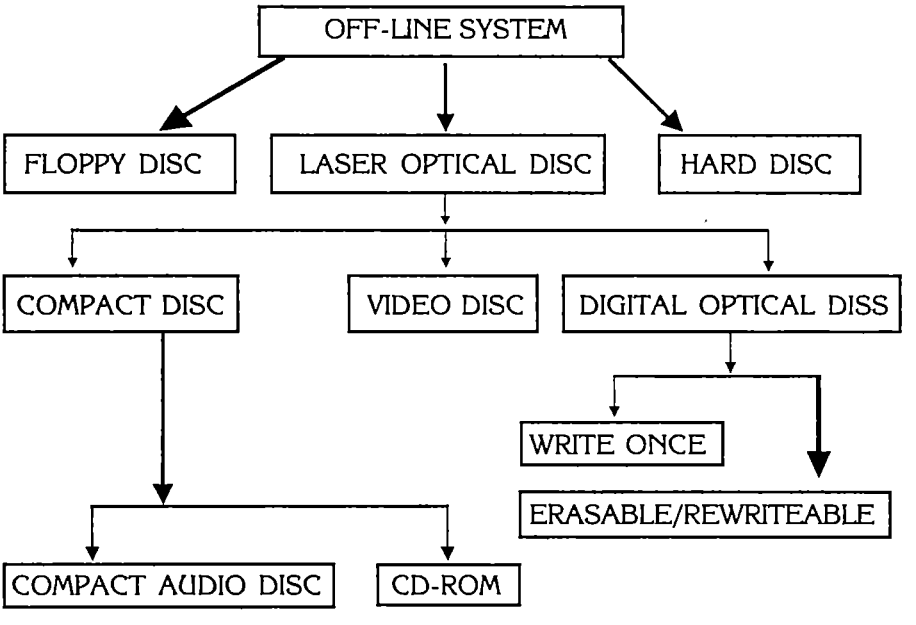
4. The ability to offer multiple products or services (e.g. printed indexes, SDI, retrospective search etc.) from a single intellectual input.
5. The ability to monitor its own operation and to produce various types of management information.
6. The ability to conduct "complex" searches involving many terms in various logical combinations.
7. The ability to produce a data base in machine readablel form, on magnetic tape, that can easily be duplicated and slipped to other information centers, thus facilitating the development of networks and other co-operative ventures.

Components of off-line system



5. OFF-LINE APPLICATIONS TO LIBRARY AND INFORMATION SERVICES

Revolutionary changes brought forth by technology are helping libraries to realise their goals of modernisation. A big list of real and hypothetical application of CD-ROMs is often touted by technology promoters. Library application are only part of the gamut of applications of CD-ROM technology. As a matter of fact, till date, the largest number of CD-ROM products in the market are aimed at the libraries and information

centers. This technology is extremely suitable for archives, data storage of bibliographical databases, dictionaries, reference books, catalogue of big libraries etc. Its having flexible retrieval capacity. CD-ROM database has become a boon of the libraries and information centers, especially in developing countries like India. We can realize and modernize following services of libraries and information centers with the help of CD-ROM.

i) Impetus to networking co-operation and resource sharing.
ii) Developing local databases.
iii) Tools for library automation, cataloging and retrospective conversion of Bibliographic data.
iv) Bibliographic instructions to users.
v) Exchange of Bibliographic data.
vi) Reference Services.
vii) Current awareness service and retrospective searching.
viii) Collection development and evaluation.
ix) Expanded services to user..

6. NEW DIMENSION IN OFFLINE SERVICES

6.1 **Impact of CD-ROM**—The impact that CD-ROM technology has on both online data base vendors and the commercial databases services in influencing the way users conduct their research.

6.2 **Offline Web Browsing**—Several benefits are there for working with web pages offline— independent of real time internet link. A group of web browser utilities has emerged to help manage web content offline, advantage and facility for innovative library applications of working with web pages offline are obvious.

6.3 **Offline access to online searching**—Libraries can precious bibliographic instructional time by harnessing the technology of the World Wide Web to create electronic research diskettes. A research diskette is essentially an electronic pathfinder whose goal is to start the research process. It links the student immediately to content rich web sites and thus eliminates the false starts and dead ends interact in preliminary web searches. Once at the front door of these websites the student can begin the research process and spend time critically evaluating web resources rather than chasing links all over cyber space. The procedure utilizes the basic functions of a wab browser and simple HTML tags can be edited in a text editor.

6.4 **Digital interactive publishing**—Many problems best early digital interactive publishing on video discs and laser discs while the rapid development of the internet, technically and in terms of user base, has in most fields now supplanted the CD-ROM. The future for offline digital resources in the cultural field will depend on one hand on the success of the current (very slow) launch of digital video disc (DVD) with its greatly increased storage capacity compared with CD-ROM, and on the other hand on the widening and cheapening of internet bandit. The launch of high-definition digital television will almost certainly change everything yet again.

7. ONLINE SERVICES

The technology which is widely used in Resource Sharing work that is online network. In this process the information is simultaneously stored and retrieved through computer terminal which is connected via a modem (modulator and demodulator) to telephone. The query entered through the terminal gets converted to the analogue mode and travels through the telecommunication line and reaches the computer systems in which the data is loaded. There would be another modem at the other end of computer system to convert the analogue signal of the quarry into digital signals which the computer understand. The records of the database are searched and the search result is converted from the digital mode, back to the analogue mode by the modem at the computer system, travels back in analogue mode, reach the modem at the terminal and get converted into digital mode and search result appears on the display unit at the terminal. All these happens in few seconds and the user feels that all these are happening instantaneously.

7.1 Some basic differences bteween off-line and on-line

a) In off-line, searcher get quick result than online. Because in online command is required to search the information.

b) Off-line (CD-ROM) has graphic facilities. It can able to provide graph, diagrams, maps, illustration etc. but in online (except the availability of TCP/IP account) only textual information can be retrieved but the biggest advantages with CD-ROM is frequency of updating. Humanities index is updated twice per week for online but quaterly on off-line (CD-ROM). This is because of production of master discs, their replication and mailing to subscribers is an expressive and time-consuming process.

c) For retrospective research document sharing, online is only alternative because major database are available from 1966

onwards, where as off-line (CD-ROM) databases are available from 1980.

d) All CD database don't use the same search software, at least two different kind of software are currently in use as a result, it is difficult for the user to refer to different manuals for different database, where as online vendors adopt Common Command Language (CCL) for searching all databases.

7.3 Online Learning (Flexible Learning Technology)—What it is

During the last two decades computers are increasingly being used for information's activities. This has resulted is rapid growth of computer based online information retrieval systems. Database and computer stored information files are produced by many Organisation such as American chemical society (Chemical Abstracts) and the US National Library of Medicine (Index Medicus) etc. These databases are now widely accessible for information searching from local terminals, which are linked to the central computer via a telecommunication network. Such efforts have resulted in the development of a number of online information retrieval systems. The use of these systems depends upon the education of users and the availability and functioning of this method of information retrieval. The aim of this section is to examine the goals and objectives for online user education and to suggest examples of methods, media and training programs suitable for accomplishing these goals and objectives.

7.3 Groups Involved in Online Learning

Different groups concerned in online learning (i.e. flexible learning technology) orientation, training and education are :

1. Database producers.
2. System operators.
3. Institutions responsible for terminal operation, for example libraries and information centers.
4. Library schools.
5. Intermediaries.
6. End Users.

The motivation for each of these groups is expected to vary considerably. Generally, the motivation for taking part in such training programs right be considered partly financial and

closely linked to the sale of specific product database on information system. For the sake of fruitful online education programme may be divided into two components : Orientation and Instruction. Orientation is concerned with enabling the user to learn the existence of computer based information retrieval and the services available. On the other hand, instruction is concerned with enabling the user to learn in detail how to carry out computerised information retrieval. The goals and objectives for online user education may be grouped in terms of the two main categories namely the end-users and the intermediaries.

7.4 Main goals of Online Learning

The following are the two main goals for IT based user learning (online learning) :

1. To enable an end-user to carry out online information search's either himself or with the help of an intermediary, within his own subject field as and when required, in connection with information needs.
2. To enable an intermediary to carry out online information search's for end-users, within many different subject fields, from the available database, on the various information retrieval systems.

7.5 Methods of Online Learning

In order to demonstrate online information retrieval, it is necessary to be able to show moving images generated in the computer search, thereby creating a feeling on reality. The ultimate aim of online instruction, for both end-users and intermediaries, is to be able to carry out online information searches. Therefore, it is essential to practice on a real system this forms part of "learning by doing" concept, which is also important in other forms of library user education. The need for live online instructions has been recognised by systems operators, who have provided various aids for teching. In MEDLING system, for example the user cab interactively ask for instructions at the beginning of the search, or for assistance during the search when part of the instruction are given as requested. The SDC (System Development Corporation) provides an online database over datebase. DBI (Data Base Index) where the user can type in the subject area of interest

and receive information as to the appropriate database ranked in order of suitability for searching. One of the most common ways of providing training for intermediateries is by letting then observe and work with a trained searcher. This is considered to be an essential part of intermediary training. Real 'hand-on' training in on-line searching is an important element in the education of end users in computerised information retrieval. This would enable the students/users to be motivated and involve themselves actively in the learning process.

8. COMBINING THE ADVANTAGES OF ON-LINE AND OFF-LINE MEDIA FOR DATABASE SERVICES

The installation of two CD-ROM databases is more advantageous for searching. The role of this database issued on floppy disc, as off line alternative is also possible and very useful.

A simple expert system developed to help users to move between off line and online searching more easily accessible. The use of CD-ROM in patent information is variedly applied now-a-days. Information on feasibility, Organisation of data and costs can be stored in CD. Producing a CD-ROM offline database containing full text and images of patent document requires an appropriate sub division of data files. Some online host of patent databases are already plan to offer CD-ROM services.

9. CONCLUSION

CD-ROM will grow as a means of disseminating information, especially to developing countries and anywhere online is expensive or unreliable. It will be boon become of its storage and retrieval capacity especially for those developing countries where importing the material in hard copy format from developed countries has always been a problem. Apart from its application for the betterment of library services, multimedia technology must take CD-ROM a better alternative in terms of affordable cost and ease of use and not a luxury but an essential new resource in the libraries of developing countries. For CD-ROM products to be successful in libraries, it is necessary to remove the obstacles for the libraries as well as to guarantee the information provides a return on their investment. One thing we would like to say that there is constant development taking place continuously in this technology, so as a librarian, we must have to identify the potential and worth of this new information product.

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Abstract : This article describes the off-line system, its advantages and application in libraries & information centres. This article also describes the on-line system, its advantages and application in libraries & information centres. On-line learning is also included in this article. A comparison between on-line and off-line system is given here.

Digitized Agricultural Information Service for Farming Community through District Libraries in Orissa : A Suggestion

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1. INTRODUCTION

India's land resources include vast areas of fertile soil. About 60% of India's total land area is agricultural land. The climatic variation in the country and the different types of soils have made it possible to grow a wide variety of crops. Major crop varieties include rice, wheat, millets, tea, sugarcane, oilseeds etc.

Agriculture being the most important occupation in India, nearly two-thirds of its workforce is engaged in Agriculture. In addition a significant part of the population is involved indirectly on agriculture. They are employed in agro-industies. Thus still today agriculture forms the backbone of the country's economy.

After Independence, the Government of India launched programs under Five Year Plans to increase crop productivity. The later half of sixties showed a turning point in Indian agriculture. By 1994-1995, the food grains were four times than it was after independence. By 1998, the wheat production was six times greater than that of 1960.

No other country in the world has such a large proportion of agricultural land. Yet, India does not have surplus food for export and sometimes falls short of its own requirements. This is mainly because the average yield per hectare of almost every crop is rather low in India. The average yield of rice about 1900 kg per hectare in comparison to 5,500 kg per hectare in China. Similarly the yield of wheat is 2,500

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kg per hectare compared to 7,000 kg per hectare in Ireland. Several factors are responsible for the low productivity such as farmers are too poor to invest in farm machinery, better seeds and fertilizers. The plots of land are very small and unfit for the use of modern equipments. But the most important drawback is their illiteracy and lack of awareness in adopting modern scientific methods in farming. This is mainly because of non-availability of proper agricultural information in the rural areas and is most unfortunate. The scientific information and techniques developed by our scientist and scholars are confined to limited area. So, they practice the old method of farming.[1]

2. DEFINITION

Digitization is a process by which physical or manual records such as text, images, video and audio data are converted into forms. This is of paramount importance when projects need directions based on already established facilities and the implementing agency needs to find the scope for expansion.[2]

3. OBJECTIVES

1. To make a few pilot surveys among farming communities to understand their information need and means and sources of satisfying them.
2. To find out if the District Libraries in the three districts under study have any facility or arrangement for providing channeling or disseminating such agricultural information.
3. To find out if the district libraries are capable or potentially capable of providing such information.
4. To find out if the district libraries are accessible to the farmers.
5. To suggest and develop an easily interact-able user-friendly model of agricultural information service.
6. To suggest also the hardware and software requirements for using such a system.
7. To provide the farmers with current scientific and technological information regarding agricultural development. The information, should include type of soil, types of crops that can be grown best in that soil, high yielding and disease resistant varieties of seeds, suitable fertilizers, pesticides, methods of farming, knowledge of symptoms, diagnosis, control of different diseases of main crops.

4. SCOPE AND COVERAGE

A study was conducted through open survey in some of the districts of Orissa by the author, especially the districts of Mayurbhanj, Sundergarh and Keonjhar. About 92% people depend only on agriculture, 66% people among them have their own lands while the rest work as daily labor. They are almost unaware of the current information in the field of agriculture.

5. FINDINGS

Form the survey the following results are found.

The farmers practise the same old method of agriculture. They can not keep pace with the changing environment, soil condition, they can not even understand which manure should be applied. Even the get some information regarding high yielding seeds, fertilizers, they can not get them actually as they can not find the source of availability.

Most of the time the 'Gram Sevak' (the Panchayat Agricultural Officer) is unavailable. So, people do not get the information in time.

The farmers are almost literate, at least most of them have attained the primary level of education. So, they are able to state their problems. But, the district libraries do not have any facility to provide agricultural information. Although they have many textual materials regarding agriculture, they do not allow accession to the farmers coming from far villages. Again the farmers come to the district town more or less regularly but they are not interested to read during that time. They are more interested on readymade information.

The libraries are more or less capable of providing such information.

Therefore, a digitized agricultural information system can be suggested for the welfare of the farmers of rural area.

6. NEED OF DIGITIZATION OF INFORMATION :

The digitization of agricultural information to a client is of immense importance, particularly in a country like ours. The client would get many information about crops and agricultural at a time.

In a breathe, it can be said that digitization of agricultural information is a multidimensional source with latest technology, with minimum maintenance cost, with maximum service to the client.

As digitized data offers the following benefits : Long term preservation of doucments, orderly archiving of documents easy and customized access to information through images and text, CD-ROMs, internet, intranet and extranet.

Digitization offers great advantages for access. Allowing users to find retrieve, study and manipulate material. Reliance on digitization as a preservation strategy could place much material at risk.[4]

Adequate information is necessary to counter the problems that are being developed day by day in our country in the field of agriculture. This information can be used as remedial measure to overcome various problems. Again, if this information is recorded manually in text form, it will take much cost as well as much time. There will be storage problem too. Again final access to that information will be much complicated.

To avoid all these hazards digitization of the information will be the unique choice. So, in this computer age, the information technology has imporved so much that the digitization of agricultural information can be suggested at a low cost with minimum maintenance.

7. SUGGESTION

In the first step, identifying the client's needs, understanding the existing system and recognizing the intended use of the digitized record should be done.

The data and information should be collected by questionnaire method, interviews etc. After that the information are classified and arranged accoding to the desired format. The images are scanned (if necessary). The digitized data are reintegrated into an easily accessible form by incorporating indexes and tables of contents.

For the easy library management system, a set of subsystems enumerable records inter-related to each other is required. In order to make available to all the district libraries under the same state or to everyone in the world use of any Relational Database Management System (RDBMS) like Oracle, SQL server is necessary as backend database. Here even Ms-access also can be used as database. Again to avoid server-site technology, visual basic can also be used as front-end programming language. On the front end or as server side technology like Active Server Pages (ASP), Java Server Pages (JSP) or Perl etc can be used. Here the SQL server as back-end database and ASP as front-end technology can be suggested because these are comparatively easier and user friendly.

SQL server (7.0) version is usually used, as it is more secured, supports variable length data, easy to access and not so complicated. During creation of the database all fields/columns should be defined. Primary key to each column should be subject to avoid duplication or haphazard manipulation.[5]

An ASP page can be created using any text editor. It is a combination of text, html tags, picture files (gif or jpg files). Here, IIS can be suggested, as the software supports web clients. It also supports delivery of Web content via HTTP. In addition to these IIS supports the FTP. Especially it is recommended in a small-scale library with LAN set up.

Now different data, i.e. about the local crop, soil etc should be identified and taken into databases. Again from the people or other Agricultural Extension Officer different feedback about the crops or disease taking place in that area and symptoms of that disease are collected. After that they are tallied with different information available in different books, journals or from the INTERNET. The diseases identified and its remedies are found out and kept in the database. Different tables are made for easy retrieval and search. People of that area are inspired to go to the library & collect their required data and utilize it for their benefit.

For an easy and quick communication as well as easy access throughout the state or country, the system should be included under LAN, WAN or INTERNET.

A multimedia device can be integrated into the system, especially for the photographs of the different diseased plants for easy detection of the plant diseases.

REQUIRED HARDWARE AND SOFTWARE FOR THE SUGGESTED SET UP

For the above device, minimum requirement of hardware and software are given below :

Hardware

A computer with munimum — Pentium-II processor.
— Internal bus speed 66-mhz.
— MMX (multimedia extension)
— 64 bit system.

A modem (for INTERNET connection)

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— 64 bit system.

A modem (for INTERNET connection)

A Printer.

An UPS (for un-interruptible power supply).

Software

Windows-95 (minimum)

V.B. 6.0 (minimum)

SQL-Server-7.0/Ms-office-97/Oracle-8i (for database)

For ASP technology

NT server with option pack 4.0 onward and IIS

OR

Window platform with Microsoft's Personal Web Server (PWS).

One browser either Internet explorer or Netscape Navigator.[7]

MODELS

Though the DSN, front-end program and back-end database are connected. The fields of the different tables can be interconnected for easy retrieval. The model we are trying to develop has been based on SQL-server as backend database and ASP and VB as front end. For easy access at first the crop should be classified and should be kept in the tables. For the details abouts an individual crop, the individual crop pages should be hyperlinked from the main table.

Some examples of the tables, containing different types of agricultural related data are given below (Some major crops cultivated in our country are taken into consideration).

Table – 1.

Types of Crops	Name of Crops
Cereals and millets	Rice, Wheat, Maize, Millet
Pulses and Legumes	Mung or green gram, Gram or chick pea, Black gram.
Vegetables	Potato, Cabbage, Gourd, Brinjal, Tomato, Radish.
Oil yielding Plants	Linseed oil, Castor oil, Groundnut oil, Mustard oil, Palm oil.
Sugar yielding	Sugarcane, Sugarbeet.

For individual crop

Again different tables can be made for different information.

For Rice Table – 2.

Crop Season	Varieties	Suitable time for sowing	Time for Harvesting
Autum-aus	Ratna, IR-50 Palman-579 Kshitish, Dular, NC-1620.	May-June	Spetember -October
Winter-aman	Prakash, Kunti, IR-20, Rupasail.	June-July	November-December.
Summer-boro	Pankaj, Maheswari Swarnadhan, NC 1281.	November-December	April-May.

Again for individual type of crops under individual crop (Aman).

Table – 3.

Types of soil	System of Cultivation	Fertillizers	After care	Common Insecticides/pesticides
Loamy-muddy	Dry or Wet	Nitrogen (40-60 kg/ha) Phosphate (20-30 kg/ha) Potassium (20-30 kg/ha)	Frequent draining reirregation, weeding, sirration of roots	Bordeux mixture, Copper sulphate ect.

For diseases of a particular crop. (rice)

Name of the disease	Causal Organism	Symptoms	Insecticides/ Pesticides	Method of application
Blast disease	Xanthomonas oryzae	Midrib and lamina of leaf contain yellow stripes, the plant wilts and dries up.	Mixture of chloramphenicol & merecury compound	Spraying
Bunt disease	Pyricularia sp	Spikelet contains greenish black balls	Mixture of copper and mercury commpound.	Spraying

8. DISCUSSION

Considering the vast agriculturl land, man power research works in the agricultural field, India can achieve the top most position is the world in crop-production if the farmers follow the modern techniques. The main purpose of this program is to serve the farmers according to their needs. The success of the program depends on the service rendered to the farmers both quantitatively and qualitatively. At the beginning it may be difficult to bring all the people to collect the information they need, as they are unaware about the program. Further, they may not agree to change the practice of old method of farming. Therefore, efforts should be made to convince them about the usefulnes of this program. They should be inspired to go to the library and collect the information according to their need.

It is not possible for an individual to implement this program successfully. Therefore, the Government should take every initiative to make this program successful. Then only, no doubt India will become one of the developed countries in the world.

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Abstract : India has brought a revolutionary change in the field of agriculture. An information explosion has been generated as a result of research work in the field of agriculture. This information is highly relevant to the farming community. But, their practical application has not yet been widely implemented. For optimum utilization of these latest developments, the information should be digitized which can be accessed easily and quickly throughout the country, even in the remote areas, so that the farmers perceive specific useful information for the solution of their problems. A survey was conducted in three district of Orissa to find out information needs of farmers in some remote villages and possibilities of information service to them from the respective district libraries. The results are reported in the paper along with a model of an IS database for farmers under preparation with VB and ASP as front end and SQL server as backend also suggested.

User Interface for Multimedia Documents Designing Aspects

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INTRODUCTION

Recent advances in storage technologies have made the creation of multimedia documents both feasible and cost-effective. Multimedia information systems have found their way into many application areas, including geographical information systems, office automation, distance learning, computer aided instruction, scientific database applications etc. wider applications also lead to both more numerous and more sophisticated end-users. Multimedia Information Systems like other types of information systems have increasingly become knowledge — based systems with capabilities to perform many sophisticated tasks by accessing and manipulating domain of knowledge. Various interfaces for interacting with multimedia are now possible for various applications. However, it is not easy to design and effective and easy-to-use multimedia interfaces that allows us to make full use of such reach information. Effective representations of multimedia contents appropriate for the applications are desired. Representation means presenting some extraction of the content in a form that supports the user's understanding.

1. NEED FOR DESIGN

A successful presentation of multimedia document depends heavily on its design. The most fundamental type of presentation communicates a single message to a small, receptive audience. Most often presentations consist of a delivery of a sequence of messages of varying importance to an audience with varying degrees of interest level and responsiveness. The design goal hen changes to delivering the messages with proper effectiveness to the correct portions of the audience.

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1.1 Human—Computer Interaction (HCI)

Human—Computer Interaction (HCI) is the study of the interaction between people, computer and tasks. HCI also involves the development and application of principles, guidelines and methods to support the design and evaluation of interactive systems. The interface between the user and computer is known as user interface. The user interface includes the concepts the user needs to know about the computer system and how it can be used carry out different tasks. Designers and developers of computer based systems are commonly required to make decisions based on assumptions about the user's prior knowledge, experience and ability to learn. [These assumptions directly influence the quality of the interaction between the user and computer]. Much emphasis is placed on understanding how people acquire, store and use knowledge and how they use this knowledge in complex tasks.

Thus there are two salient aspects in the design of multimedia documents :

- Informing and guiding the computer user through a complex body of presentation.
- Creation of visual design rhetoric appropriates for interactive computer displays.

1.2 What is Visual rhetoric ?

1.2 Visual rhetoric refers to conveying information through the visual aspects of a document, presentation etc. rather than through its verbal aspects. It encompasses

Document design

The use of graphics

Visual depiction of data etc.

Visual rhetoric explores ways of making documents more effective for their audience through designing text incorporating visual elements.

1.3 The purpose of graphic interface design

The purpose of graphic interface design is to provide screen displays that create an operating environment for the user forming an explicit visual & functional context for the computer user action. It focuses the user's experiences & makes the organizational structure of the computer system or multimedia document visible & accessible to the user.

Graphic interfaces also offer a visual & functional theme or metaphor to the user. Interface metaphors use references to familiar habits, tasks & concrete objects as a means of making the abstract & invisible functions of the computer easier to understand & remember.

2. USER INTERFACE DESIGN

The central issue is to make the computer transparent to the user just as a pencil is transparent to its user. The best way to achieve this transparency is to understand the user's own model of what the task requires & incorporate that into the user interface.

2.1 Information Design

Information design means clarifying your communication goals and arranging your ideas into a design that serves those goals

Content Selection

Decide on the scope and depth of content based on needs assessment Identify type of learning outcome based on the goals of the project Organize content

Media Selection

Use the appropriate format to achieve the leaning outcome in the most efficient way.

Text
Illustrations/Graphic
Animation
Video
Audio

Co-ordination—may be viewed as a process of composition. Co-ordination needs mechanisms such as

—Encoding techniques (e.g. Among graphical attributes sentence forms, audio attributes or between media)

— Presentation of objects that represent facts (e.g. Co-ordination of the spatial and temporal arrangement of paints in a chart)

— Multiple display (e.g Windows)

An effective design process should not only involve sequential flow of actions, but also, parallel and interactive actions. This means that there is a requirement for extensive feedback going on between the components making decisions about media and modalities Additionally, the design includes a number of higher-level concerns such a goals and focus of the dialogues, the user's context and current task and media selection to represent this information in a way that corresponds to these concerns.

2.2 Visual design

Information oriented Design seeks a balance between practical necessities of information management and esthetics of presenting text and graphics to the user. Interface elements (symbols, icons, buttons, windows etc.) are organized over a design grid. Primary goal is to establish a consistent visual structure, in which important information is immediately obvious, and where everything else is subordinate and undistracting. Graphics must be robust, carefully crafted to match the screen grid of pixels. Delicate graphics or typefaces that depend on fine details should be avoided. Screens which incorporate large amount of text must establish a clear and consistent graphic layout for the text block. Users of multimedia computers documents don't just look at information, they interact with it in novel ways. Analysis of relationship between visual and functional goals and requirements of the project and the standard interface guidelines of the operating system must be made.

2.3 Interaction Design

In the process of interaction design you start with the flowchart from information design and create features that allow users to travel through and manipulate the content. This means motivating users to have the experience, by giving them clear guidance options, creating a clear path through the information giving users controls, providing feedback on their progress and making the navigation easy by providing multiple access routes. The underlying steps should be followed :

Create a map to orient user

Design navigation and access routes

Design controls for interaction

The following feedback issues should be considered

Feedback to learners after they have responded facilitates learning.

Feedback for incorrect responses should include corrective procedures and further testing and feedback as necessary

Immediate feedback is not always essential

Feedback should be friendly and positive

Over-emphasis of praise for the correct response should be avoided.

Reinforcement of the wrong answer (e.g. by providing a more rewarding graphic) should be avoided.

3. PRINCIPLES OF INTERFACE DESIGN

The following must be considered during interface design :

- corporate conventions
- Balance
- Proportion
- Sequence
- Unity
- Emphasis
- Similarity
- Foreground/Background symbol stability

3.1 Corporate convention

To produce an effective electronic display, graphic design principles, coding standards and various recommendations for text readability or legibility have to be taken into account. The design principles on which they are based are the same as those used by graphic artists and designers. Of course there could be different style guides for different types of multimedia applications.

3.2 Balance

This refers to the visual distributions of various elements comprising a display i.e. this addresses how to distribute the apparent weight of the elements so that the work does not appear about to topple from being heavier on one side than the other.

3.3 Proportion

This refers to the relationship between the visual elements of a display. The relationship includes height and width rations, the most aesthetically pleasing visual relationship is an aspect ratio of I to 0.618.

3.4 Sequence

Visual elements can be planned so as to lead the movement of the eyes through a display. For example the eye will move from a large image to a smaller one from a saturated texture to a desaturated texture.

3.5 Unity

Elements within a display should convey the impression of a well though of whole that the elements have some form of common

relationship. Common local background texture against which foreground symbols are displayed can be used to unity various elements on the display in a logical grouping.

3.6 Emphasis

The most important information within the display is emphasis so as to draw the viewer's attention to it. The principle of sequence can be applied employing techniques such as using non-symmetrical images or sizes to attract the user's attention.

3.7 Similarity

Images displaying similar attributes such as form or size are perceived as belonging together of having similar relationships. Designers should exploit this habit of perception when appropriate but should avoid confusing users by failing to appreciate its significance when such similarities are inappropriate.

3.8 Foreground/Background symbol stability

Symbol or icon design should provide the viewer with firm and stable images in relation to the background. Foreground stability can be improved by increasing the thickness of the outline contour or preferable by filling in the symbol with a texture.

4. CONCLUSION

Good design is the backbone of good presentation execution. It should make things visible, the alternative actions and the results of actions. It follows natural mapping between the information that is visible and the interpretation of the System State. While designing user interface it is essential to stick to consistency in implementation-identical sequences, terminologies, graphic objects, dialogue windows should be used good interface should provide informative feedback and flexibility in use. So as to support user specification and perception.

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Abstract : The success of a multimedia presentation depends chiefly on its user interface design. It is the single most important element of any multimedia presentation. This paper shows the process of constructing the design goal to dictate a better methodology for designing a knowledge-based, user-specific multimedia information system.

Agricultural Information System : An Overview

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Agriculture is a subject field which covers a large area. The history of agriculture is as old as the human civilization. Agriculture provides the basic wherewithal of existence in the form of food, clothing, work to the people and income for those who work. Therefore, the true fact is that the man cannot live without agriculture. The prosperity of the country and welfare of its people depends largely upon agricultural output. Therefore, it is the main stay of country's economy.

Agricultural information is actually an activated knowledge of agriculture & plays an important role in modernization of agriculture in the country. Due to population explosion, depletion of natural resources & the constraints in food production agricultural information is also getting more & more importance as we are in the process of modernising our traditional agriculture into an industry.

A system is an organisation existing naturally or being formed artificially (i.e. man made) having various functional units to carry out some functions at a particular environment to achieve some objectives. An effective information system in agriculture could play a vital role by promptly supplying all the information relating to agriculture to the users who need it.

NEED FOR AGRICULTURAL INFORMATION SYSTEM

i. The agricultural sector is the most important sector in the country's economy. Therefore, information on new technological innovations & its implications for production & general agricultural policy should be made available to the concerned people.

ii. The agriculture sector has a very large number of producers & agricultural production is affected by soil types, irrigation availability, weather, seed variety, fertilizer dosages, pesticides etc. Moreover,

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different crops can be grown from the same land. All these involve vast amount of data for updation of these information agricultural information system is necessary.

iii. The information system on agriculture is vital for another reason. The data required for a successful management of this sector are collected by different organisations like-Meteorological Department collected data on climate, rain, moisture availability etc., The Ministry of Agriculture collected data on areas alloted to different crops, data on irrigation are provided by the Irrigation Department. An information system can provide the data from many sources to the various operating agencies.

iv. An agricultural information system is also important for another reason. Farmers are the nucleus of all agricultural production. They need information for crop improvement, crop production, crop protection, crop utilization. For providing the farmers up-to-date data in a form in which they can understand & use them for taking rational decision, information system is very important.

v. The link has to be established between the farmers, extension workers, state governments, agricultural universities, research institutes & scientists. The entire chain is governed by the network of information where the flow of information can be channelized through a national agricultural information systems.

vi. An information system also helps in decision making in a series of policy issues :—

(a) What crop & variety of crop to sow in what areas?

(b) What should be the level of inputs?

— Fertilizers.
— Water.
— Pesticides.

(c) What should the inputs be applied?

— Timing.
— Spacing, seedrate
— Soil treatment
— When to sell the output etc.

TYPES OF AGRICULTURAL INFORMATION

(I) Bibliographic Information : Listing of micro & macro literature in systematic way is called bibliographic work & such lists are called bibliographies or documentation lists.

This information taken in two form :

(a) Bibliographic database with reference e.g.. Agrindex (FAO).

(b) Bibliographic database with abstracts e.g.. CABI Abstacts.

(ii) Statistical Information : Statistics deals with the collection, analysis, interpretation & presentation of numerical & quantitative data. Here descriptive information is reduced to figure to attract the notice of the public.

These information are :

(a) Agricultural crops data pertaining to area, production, yield, export-import, consumption etc.
(b) Fertilizer use, intensity, extent & dosage applied in paste.
(c) Soil surveys, soil type, fertility & land records.
(d) Meteorological data (rainfall, temperature, weather & climate).
(e) Water availability data, Irrigation availability by canals.
(f) Various agronomic experimental data.
(g) Trade & commerce.

(iii) Biological Information : Biological information include : Agriculture research material in raw material form such as herbaria, culture collection on virus, bacteria, algae, fungi, insect pests, germplasm collection of cereals, vegetables, ornamental plants & animal & fisheries etc. All living & fossil biological collections are the biological information.

(iv) Technical Information : Technical information include : information about what crop to grow, allotment of land to different crops, what varieties of seeds are to be used, what new seeds to be developed for which crop & which zone & with what characteristics, what will be the levels of applications of different inputs—i.e. allotment of water to each crop at different stages of its growth, irrigation techniques, what measure are taken to preserve & improve the productivity of the crop etc. knowledge of various micronutrients & symptoms of their deficiencies is very important. Other technical information includes information about optional allocation of fertilizers of different crops in different agro-climatic zones, information about their levels of toxicity, crop seasons (Khariff, Rabi etc.), rainfall, soil, characteristics etc.

(v) Information On Agro-products : Information on production of several key crops like rice, wheat, pulses, oil-seeds, cotton, jute, sugar-cane & different plantation crops like coffee, tea, rubber etc. Information about when to sell the agricultural output & prices of different output. Formal & non-formal market survey while trading an agricultural product — all these are information on agro-products.

SOURCES OF AGRICULTURAL INFORMATION

(i) Bibliographic Sources of Agricultural Information : Eg. Bibliography of Indian Agriculture (BIA) created by the Indian Agricultural Research Institute Library, New Delhi, since 1944 is still handled manually. It is also termed as Indian Agricultural Reference Media. This bibliography covers Indian literature on plant sciences—cereals, oil seeds, pulses, ornamental plants, fruit & vegetable, spices, medicinal plants & cash crops.

There are many national & international bibliographical sources of information.

(ii) Statistical Sources of Agricultural Information

Examples of some statistical sources are :

Indian Agricultural Statistics.

Indian Statistical Abstracts.

FAO Production year Book (1959) continued from FAO. Year Book of Food and Agricultural Statistics. World census of Agriculture published under FAO.

(iii) Electronic Sources of Agricultural Information : With the emergence of information technology, there has been a world wide trend for collecting & storing of information on electronic media like CD-ROM, Magnetic tapes, Compact disc, Floppy discs & digital cartridges.

The information of agricultural interest has been stored and made available on CD-ROM by CABI, FAO, NAL of USA etc. Agris database, Agricola also are important sources.

In India CPRI, Shimla has brought out information on potato in digital form.

(iv) Institutional Sources of Information : These sources are

(a) Organisations (non-governmental) working in the area of agricultural and rural development.

(b) Government institutions eg. IARI (Indian Agriculture Research Institute), CRRI (Central Rice Research Institute).

(c) Agricultural Universities, eg. Bidhan Chandra Krishi Viswavidyalaya, Kalyani.

(d) Gramin Bank and Corporation Bank.

(v) Media : Media is another important source of information. These are 3 types — Audio, Visual & Printed eg.

(a) Television programmes like agricultural news, weather news etc. telecasted both by government owned channels and private channels.

(b) Programmes broadcasted through radio, eg. Krishikathar Asar.

(c) Articles appearing in daily newspapers, magazines.

(vi) Local bodies as sources : Primary information are provided to farmers by Panchayats, Block offices, Extension workers, Clubs etc.

USERS

Information begins & ends with user community. It is they who are generating the information, they who are using it, they who will decide what type of service they want. Users are of diverse groups — On one hand highly specialised research workers and on the other hand, illiterate farmers. In between them there are technical personnel, administrators, policy makers, bankers, industrialists, students, extension workers, library and information personnel, skilled & semi skilled workers, agro-industrialists, traders (agricultural).

NATIONAL AGRICULTURAL INFORMATION SYSTEM

Though agriculture is the backbone of India's national economy but there is no organised information system so far in the field of agriculture at the national level.

Some major developments in the field are discussed here which shows that the development is taking place & with great speed.

ICAR : Indian Council of Agricultural Research (ICAR) is the apex body for promoting & accelerating agricultural development. It has under its umbrella :—

(i) 45 central Research Institutes, (ii) 4 Bureaux, (iii) 10 Project Directories, (iv) 30 National Research Centres, (v) 80 All India Co-ordinated Research Projects, (vi) 28 State Agricultural Universities and 1 Central Agricultural University, (vii) 105 Agricultural Colleges, 24 Veterinary Colleges, (viii) 261 Krishi Vigyan Kendras.

All these institutions can be co-ordinated & integrated to develop a feasible national information system.

ARIC : The activities of Agricultural Research Information Centre (ARIC) of ICAR was started in 1967 as a research project file unit on the model of the Current Research Information System (CRIS) of the United States, Department of Agriculture. The main purpose of such system is to identify the research gaps with a view to improve the development of research methodology & transfer of technology, monitoring of research in India.

ARIC is the national input centre for the International Information System for Agricultural Sciences & Technology (AGRIS) since 1975. ARIC

is also the national input centre for Current Agricultural Research Information System (CARIS).

ICAR has also one AGRIS input centre working at Indian Agricultural Research Institute, IARI.

ARIS : Agricultural Research Information System

The ICAR has initiated a project called *Agricultural Research Information System* (ARIS) with financial assistance from the World Bank. This system with its headquarters situated at the Agricultural Research Information Centre (ARIC) in Krishi Arunachalam Bhavan Kendra, New Delhi is a system of interconnected system which keeps records of more than 5,000 ongoing research projects in different ICAR research institutes & agricultural universities. The ARIS system based on the present day existing infrastructure of libraries has literature resources manpower & physical facilities. Automation & computerisation has begun. Information technology is being generated indigenously.

The Objectives of this system are

i) To improve the capacity of research organisations to organise, store & retrieve information.

ii) To develop procedures & mechanisms for information sharing institute wide, nation wide & world wide.

iii) To improve the capacity of research organisation to plan, monitor & evaluate research plans. And

iv) To make information easily available to scientists.

Facilities of this System

— Setting up of ARIS laboratories.
— Grant in aid of computer hardware & software equipment.
— Training.
— Installation of Local Area Network (LAN).
— Connection to Wide Area Network (WAN).
— WAN connectivity through VSAT and
— Access to international networks like ERNET & NICNET.

Network Services

— Electronic Mail.
— Bibliographic database and CD-ROM.
— Bulletin board.
— Electronic circulars.

— Gopher.

— World Wide Web (WWW).

Operational Aspects

— Documentation of findings of research projects recently completed.

— Information on ongoing research projects.

— Establishment of project bank for future thrust areas in research.

— Information funding agencies for research.

— Sharing of research information with other institutes.

— Access to all networks of national & international level.

— Creation of a digital library of the latest technology.

— Personnel Information System.

It is hoped that in future there will be an effective information network supported by electronic & communication media, satellite facility & IT applications.

Besides, ENVIS (Environmental Information System), NISSAT (National Information System for Science & Technology), INFLIBNET (Information & Library Network), IFLIN (Indian Forest Libraries Information Network) — are played an important role in the field of agricultural information.

INTERNATIONAL AGRICULTURAL INFORMATION SYSTEM

The importance of agriculture has prompted many advanced countries to set up information systems. Some International Agricultural Information System are as follows :—

AGRIS — International Information System for Agricultural Sciences & Technology

AGRIS is an international information system under FAO (Food and Agricultural Organisation) of United Nations, providing access to world information in the field of agriculture & related fields to researchers, planners, extension workers & farmers.

It is a co-operative & decentralised system covering both conventional & grey literature where in 171 countries & 24 regional & international research centres participate.

It functions at 2 levels — AGRIS level I and AGRIS Level II.

AGRIS Level I became fully operational in January 1975. In this level, AGRIS functions to have comprehensive coverage in providing documentation & current awareness service. Its main outputs are :

AGRINDEX, a monthly printed bibliography AGRIS database on magnetic tapes.

The main publications of AGRIS are :

AGRINDEX / AGRIS Database on Magnetic tapes.

AGROVOC — a multilingual thesaurus various reference manuals & guides.

AGRICOLA — Agriculture Online Access

AGRICOLA is introduced by National Agricultural Library of United States. It focusses more on information generated on agriculture in USA. This online service takes updated information from the latest journals. The coverage includes references to journal articles, Government publications, technical reports, thesis etc. It corresponds to printed products like Bibliography of Agriculture. It is available in magnetic tape since 1970 & online access is possible through DIALOG & BRS AGRICOLA is now available on CD-ROM.

CRIS — Current Research Information System

This information system of USDA (United States Department of Agriculture), contains items of currently publicly supported agricultural and forestry research projects of USDA agencies, state agricultural experiment stations and other co-operating institutions.

This information system given information on what is being done, personnel of the project, organisations, place, year of commencement, progress & publications emanating from the project. CRIS is available in machine readable form since 1969 and is accessible through DIALOG.

CAB — Commonwealth Agricultural Bureaux

This is a co-operative organisation which primarily concerned with the collection & dissemination of information rather than with carrying out primary scientific research. The organisation was established in 1929 under the name Imperial Agricultural Bureaux. It now consists of 14 Institutes & Bureaux, all but one of which are located in the United kingdom.

The CAB Abstracts database is compiled from the world's scientific & technical literature. Over 40,000 published documents, including research papers, conference proceedings & papers, books, reports & theses are received annually from over 130 countries in 50 languages. More than 15,000 new records are added to the database each year. Over 3 million abstracts from world literature have been added to the computerised database since 1973.

The CAB currently publishes 19 abstracting journals in agrobiological subject. The contents of all journals now available on the Internet.

CABI — Commonwealth Agricultural Bureaux International

This international, inter-governmental organisation based in Wallingford, UK was established in 1920. It provides a wide range of agricultural information service to a wide range of users including farmers, researchers, extension staff, agro-business & trade. It provides document delivery through network of special libraries throughout U.K. It produced CABI Thesaurus. Developing countries who cannot afford to have online access, CABI has solution to overcome the constraints by means of electronic access to search database on CD-ROMs. CABI has been conducting annual training programme in U.K. since 1980 on "Information on Agriculture" for the benefit of libraries, documentalists & information specialists from developing countries.

AGRIS is available on CD-ROM published by Silver Platter AGRIS Level II provide information pertaining to research projects & other data of agricultural interest. Some AGRIS input centres are :

(i) Agricultural Information Bank of Asia (ABIBA), Philippines covers ASEAN countries.

(ii) The Commission of European Communities (CEC) in Brussels covers CEC countries & Portugal. The ICAR has started sending Indian inputs for the AGRIS database at Vienna for publication in the AGRINDEX since May, 1975.

CARIS — Current Agricultural Research Information System

This information system envisaged by FAO operating since 1979. It is a system which deals with information in ongoing research projects. The CARIS project aims at establishing an international information system which would collect, organise & disseminate basic data on current research in the field of agriculture, animal production, forestry, inland fisheries & food & mainly on research institutions, research workers, programmes & activities carried out in different countries in order :

(i) to improve communications between institutions & between scientists.

(ii) to assist in the evaluation of the adequacy of existing research effort, and the identification of major gaps & weakness, as an aid to decision making at both the national and international level.

It provides a mechanism whereby developing & developed countries can exchange information on their current agricultural research activities.

This information system was established on the model of Current Research Information System (CRIS) of USDA.

CARIS inputs and service include : provision on subjects of data on magnetic tape & diskette, online search & SDI.

Two software packages CARIS/ISIS based on CDS/ISIS & CARIS/MINISIS based on IDRC's MINISIS softwares are made available free to participating countries for the processing of CARIS data.

AGLINET — Agricultural Libraries Network of FAO, Rome

It is a worldwide network of highly specialised agricultural libraries of the world established in 1974. It is a voluntary association of about 45 libraries spread over Asia, Europe, Africa, America & Oceania collaborating to improve the provision of needed publications & information in agriculture and allied sciences.

It published AGLINET Union List of Serials which cover journals mostly cited in AGRIS database together with holding in AGLINET libraries.

The most frequently used member libraries are NAL (National Agricultural Library) of United States Department of Agriculture (USDA), Agricultural University, Wageningen, ICRISAT, India etc. The Indian Agricultural Research Institute Library New Delhi is also a member of AGLINET since 1991.

SATCRIS — Semi-Arid Tropical Crops Information Centre, India

It is an information system which provides information on ICRISAT's (International Crop Research Institute for the Semi-Arid Tropics, Patancheru, India) mandate crops like sorghum, pearl millet, chick pea, pigeon pea and groundnuts. It is acting as AGRIS — Level II nodal centre. It adds about 700 references every month including ICRISAT's publications & relevant extracts from AGRIS and ICRISAT's publications & relevant extracts from AGRIS and CABI. It provides services like SDI, Literature — search, Abstract-service, Literature reviews & offers information consolidation products on specific topics.

ARCIS — Agricultural Research Current Information System

ARCIS is an information system holding titles, researcher's names & institutes, administrative codes, free key words & costs for about 4,500 research projects sponsored by the Agricultural Research Council (ARC). The Ministry of Agriculture, Fisheries & Food (MAFF), the Department of Agriculture and Fisheries for Scotland (DAFS) and the Department of Agriculture, Northern Ireland (DANI).

Other notable information centres are

AGRINTER — Inter – American Information Systems for Agricultural Sciences.

CIDIA — Inter – American Centre for Agricultural Documentation And Information, Costa Rica.

NTIS — National Technical Information Service, USA.

CAIN — Cataloguing And Indexing Systems of National Agricultural Systems of National Agricultural Library, Washington.

AGECON — American Agricultural Economics Documentation Centre.

ARC — Agricultural Research Council, UK.

PUDOC — Centre for Agricultural Publishing & Documentation, Netherland.

DANIL — Department of Agricultural for Northern Irelands.

Some important agricultural research institutes are

IRRI — The International Rice Research Institute, Manila, Philippines.

CIMMYT — International Maize & Wheat Improvement Centre, Mexico.

CIP — International Potato Centre, Lima, Peru.

IITA — International Institute of Tropical Agriculture, Ibadan, Nigeria.

Tropical Development & Research Institute, London.

IFPRI — International Food Policy Research Institute, Washington, D.C.

CIAT — Centro International Agricultural Tropical, Columbia.

South African Sugar Association Experiment Station, Mount Edgecoumbe, Natal, South Africa.

Besides, there are other systems like Chemical Abstracts, Biosis, Food Sciences and Technology Abstracts and TROPAG and Rural Abstracts which also cover agricultural information.

CONCLUSION

Information is an important resources of resources without which the other resources can not function. Today the quantity of existing information is so large & variety so diffuse that much research & action

are needed to ensure that agriculturists, farmers know about available information relevant to their work obtain it easily. Therefore to cope with this situation organised information systems in the field of agriculture are required so as to collect, process & make the relevant information readily & comprehensively to its users.

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Abstract : This article describes the agricultural information system of India. Information about international agricultural information systems with types, sources, users and uses need have also been discussed. Names of some important agricultural research institutes and some other notable information centres in India and abroad are appended.

GUIDELINES TO CONTRIBUTORS

All manuscripts should be addressed to the Honorary Executive Editor, Calcutta University Journal of Information Studies (CUJIS), Department of Library and Information Science, University of Calcutta, Asutosh Building, 87/1 College Street, Kolkata – 700 073. Submission of an article will be held to imply that it has not been previously published and is not under consideration for publication elsewhere. Manuscripts should be legibly written in English or Bengali. Typed or computer print out manuscripts are preferable. Manuscripts may be submitted in electronic form in 3½" floppy diskette in TXT, RTF or WORD format along with a printout. The title should be brief. Every manuscript should be furnished with full address (s) of the author (s) and an abstract in English. References should follow the Indian standard IS : 18-1970. All manuscripts are subject to reviewing and fine tuning where necessary. Types of articles CUJIS include are research papers, research articles, review articles, tutorial articles, general articles, correspondence.

Calcutta University Journal of Information Studies
No. 5 2002-2003

CONTENTS

Introduction 1

Our Archival Heritage—What is the Future of the Past? 5
— Arun Kanti Dasgupta

Destroy to Preserve : The Librarian's Dilemma 16
— Himadri Bhattacharya

Manpower Planning in Academic Library with Sepcial Reference to Non-Government College Library Staff Pattern 26
— Dibyendu Paul

Standard for Information Retrieval : A Review of Z39.50 37
— Anjali Maisal

Impact of Off-line and On-line Services on Libraries and Information Centres 48
— Subarno Das & Tridib Chattopadhyay

Digitized Agricultural Information Service for Farming Community through District Libraries in Orissa : A Suggestion 56
— Chandralekha Mohanta

User Inferface for Multimedia Documents : Designing Aspects 64
— Subir Das

Agricultural Information System : An overview 71
— Rakhi Chakrabarti

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